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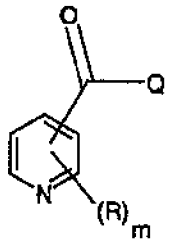

(I)

(57) Abstract

Compounds of formula (I) in which the substituents are as defined in claim 1 are suitable for use as herbicides.

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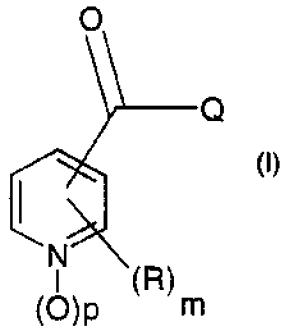
PYRIDINE KETONES USEFUL AS HERBICIDES

The present invention relates to novel herbicidally active pyridine ketones, to processes for their preparation, to compositions which comprise these compounds, and to their use for controlling weeds, in particular in crops of useful plants, or for inhibiting plant growth.

Pyridine ketones having herbicidal action are described, for example, in WO 97/46530. We have now found novel pyridine ketones having herbicidal and growth-inhibiting properties.

The present invention thus provides compounds of the formula I



(I)

in which

each R independently is C_1-C_6alkyl, C_2-C_6alkenyl, C_2-C_6haloalkenyl, C_2-C_6alkynyl, C_2-C_6 haloalkynyl, C_3-C_6cycloalkyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkyl, C_1-C_6haloalkylthio, C_1-C_6haloalkylsulfinyl, C_1-C_6 haloalkylsulfonyl, C_1-C_6alkoxycarbonyl, C_1-C_6alkylcarbonyl, C_1-C_6alkylamino, di-C_1-C_6 alkylamino, C_1-C_6alkylaminosulfonyl, di-C_1-C_6alkylaminosulfonyl, -$N(R_1)$-S-R_2, -$N(R_3)$-SO-R_4, -$N(R_5)$-SO_2-R_6, nitro, cyano, halogen, hydroxyl, amino, formyl, hydroxy-C_1-C_6alkyl, C_1-C_6 alkoxy-C_1-C_6alkyl, C_1-C_6alkoxycarbonyloxy-C_1-C_6alkyl, C_1-C_6alkylthio-C_1-C_6alkyl, C_1-C_6 alkylsulfinyl-C_1-C_6alkyl, C_1-C_6alkylsulfonyl-C_1-C_6alkyl, thiocyanato-C_1-C_6alkyl, cyano-C_1-C_6 alkyl, oxiranyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, C_1-C_6alkoxy-C_1-C_6alkoxy, cyano-C_1-C_6 alkenyloxy, C_1-C_6alkoxycarbonyloxy-C_1-C_6alkoxy, C_3-C_6alkynyloxy, cyano-C_1-C_6alkoxy, C_1-C_6 alkoxycarbonyl-C_1-C_6alkoxy, C_1-C_6alkylthio-C_1-C_6alkoxy, alkoxycarbonyl-C_1-C_6alkylthio, alkoxycarbonyl-C_1-C_6alkylsulfinyl, alkoxycarbonyl-C_1-C_6alkylsulfonyl, C_1-C_6alkylsulfonyloxy, C_1-C_6haloalkylsulfonyloxy, phenyl, benzyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzylthio, benzylsulfinyl or benzylsulfonyl, where the phenyl groups may

be mono- or polysubstituted by halogen, methyl, ethyl, trifluoromethyl, methoxy or nitro, or R is a five- to ten-membered monocyclic or fused bicyclic ring system, which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, where the ring system is either attached directly to the pyridine ring or attached to the pyridine ring via a C_1-C_4alkylene group, and where each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms, and where the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6 haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5alkoxyalkylthio, C_3-C_5 acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6 haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylsulfonyl, aminosulfonyl, C_1-C_2 alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3alkylene-R_7, NR_8R_9, halogen, cyano, nitro, phenyl and benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, and where substituents on the nitrogen in the heterocyclic ring are different from halogen;

m is 1, 2, 3 or 4;

p is 0 or 1;

R_1, R_3 and R_5 independently of one another are hydrogen or C_1-C_6alkyl;

R_2 is $NR_{10}R_{11}$, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6 haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_3-C_6cycloalkyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

R_4 is $NR_{12}R_{13}$, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6 haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_3-C_6cycloalkyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

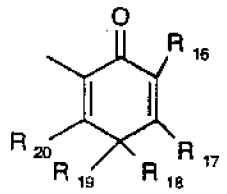
R_6 is $NR_{14}R_{15}$, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6 haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_3-C_6cycloalkyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

R_7 is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3 alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

R_8, R_{10}, R_{12} and R_{14} independently of one another are hydrogen or C_1-C_6alkyl;

R_9, R_{11}, R_{13} and R_{15} independently of one another are C_1-C_6alkyl or C_1-C_8alkoxy;

Q is the group Q_1



(Q_1) ,

in which

R_{16}, R_{17}, R_{18} and R_{19} independently of one another are hydrogen, hydroxyl, C_1-C_4alkyl, C_2-C_6 alkenyl, C_2-C_6alkynyl, C_1-C_4alkoxycarbonyl, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6 alkylsulfonyl, C_1-C_4alkyl-$NHS(O)_2$, C_1-C_4haloalkyl, -NH-C_1-C_4alkyl, -N(C_1-C_4alkyl)$_2$, C_1-C_6 alkoxy, cyano, nitro, halogen or phenyl, which for its part may be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, amino, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6 alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4 haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4alkyl-$S(O)_2N(C_1$-C_4 alkyl), halogen, nitro, COOH or cyano; or two adjacent substituents from the group consisting of R_{16}, R_{17}, R_{18} and R_{19} form a C_2-C_6alkylene bridge;

R_{20} is hydroxyl, O^-M^+, halogen, cyano, SCN, OCN, C_1-C_{12}alkoxy, C_1-C_4alkoxycarbonyl-C_1-C_4 alkoxy, C_1-C_{12}alkylthio, C_1-C_{12}alkylsulfinyl, C_1-C_{12}alkylsulfonyl, C_1-C_{12}haloalkylthio, C_1-C_{12} haloalkylsulfinyl, C_1-C_{12}haloalkylsulfonyl, C_1-C_6alkoxy-C_1-C_6alkylthio, C_1-C_6alkoxy-C_1-C_6 alkylsulfinyl, C_1-C_6alkoxy-C_1-C_6alkylsulfonyl, C_2-C_{12}alkenylthio, C_2-C_{12}alkenylsulfinyl, C_2-C_{12} alkenylsulfonyl, C_2-C_{12}alkynylthio, C_2-C_{12}alkynylsulfinyl, C_2-C_{12}alkynylsulfonyl, C_2-C_{12} haloalkenylthio, C_2-C_{12}haloalkenylsulfinyl, C_2-C_{12}haloalkenylsulfonyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylthio, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfinyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfonyl, (C_1-C_4alkoxy)$_2$P(O)O, C_1-C_4alkyl-(C_1-C_4alkoxy)P(O)O, H(C_1-C_4alkoxy)P(O)O,

$R_{37}R_{38}N$, $R_{71}R_{72}NNH$-, $R_{21}R_{22}NC(O)O$-, $R_{73}R_{74}NC(O)NH$-, C_1-C_4alkyl-$S(O)_2NR_{39}$, C_1-C_4 haloalkyl-$S(O)_2NR_{40}$, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_{18}alkylcarbonyloxy, where the alkyl group may be substituted by halogen, C_1-C_6alkoxy, C_1.C_6alkylthio or cyano,

C_2-C_{18}alkenylcarbonyloxy, C_2-C_{18}alkynylcarbonyloxy, C_3-C_6cycloalkylcarbonyloxy, C_1-C_{12} alkoxycarbonyloxy, C_1-C_{12}alkylthiocarbonyloxy, C_1-C_{12}alkylthiocarbamoyl, C_1-C_6alkyl-NH(CS)N(C_1-C_6alkyl)-NH-, di-C_1-C_6alkyl-N(CS)N(C_1-C_6alkyl)-NH-, benzyloxy, benzylthio, benzylsulfinyl, benzylsulfonyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, phenylsulfonyloxy or benzoyloxy, where the phenyl groups for their part may each be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4 haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4alkyl-$S(O)_2N$(C_1-C_4 alkyl), halogen, nitro or cyano,

or a group Ar_1-thio, Ar_2-sulfinyl, Ar_3-sulfonyl, -OCO-Ar_4 or NH-Ar_5 in which Ar_1, Ar_2, Ar_3, Ar_4 and Ar_5 independently of one another are a five- to ten-membered monocyclic or fused bicyclic ring system which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, and in which each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms, and in which the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5 alkoxyalkylthio, C_3-C_5acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylsulfonyl, aminosulfonyl, C_1-C_2alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3alkylene-R_{41}, $NR_{42}R_{43}$, halogen, cyano, nitro, phenyl and benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, and where substituents on the nitrogen in the heterocyclic ring are different from halogen;

R_{41} is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3 alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3 haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

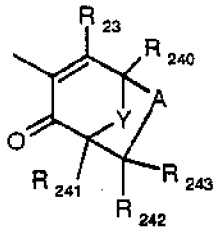
R_{42} is hydrogen or C_1-C_6alkyl;

R_{43} is C_1-C_6alkyl or C_1-C_6alkoxy;

R_{21}, R_{37}, R_{39}, R_{40}, R_{71} and R_{73} independently of one another are hydrogen or C_1-C_4alkyl;

R_{22}, R_{38}, R_{72} and R_{74} independently of one another are hydrogen, C_1-C_{12}alkyl, hydroxyl, C_1-C_{12}alkoxy, C_3-C_6alkenyloxy or C_3-C_6alkynyloxy; or R_{21} and R_{22} together or R_{37} and R_{38}

together or R_{71} and R_{72} together or R_{73} and R_{74} together are pyrrolidino, piperidino, morpholino, thiomorpholino, which may be mono- or polysubstituted by methyl groups; or are the group Q_2



(Q_2) ,

in which

Y is a chemical bond, an alkylene group A_1, carbonyl, oxygen, sulfur, sulfinyl, sulfonyl, $-NHR_{248}$ or $NH(CO)R_{249}$;

A_1 is $C(R_{246}R_{247})m_{01}$;

A is $C(R_{244}R_{245})r$;

r and m_{01} independently of one another are 0, 1 or 2;

R_{240} is hydrogen, methyl or C_1-C_3alkoxycarbonyl;

R_{241}, R_{242}, R_{243}, R_{244}, R_{245}, R_{246} and R_{247} independently of one another are hydrogen, halogen or methyl, or R_{243} together with an adjacent group R_{245} or R_{247} is a chemical bond;

R_{248} and R_{249} independently of one another are hydrogen or C_1-C_4alkyl;

R_{23} is hydroxyl, O^-M^+, halogen, cyano, SCN, OCN, C_1-C_{12}alkoxy, C_1-C_4alkoxycarbonyl-C_1-C_4 alkoxy, C_1-C_{12}alkylthio, C_1-C_{12}alkylsulfinyl, C_1-C_{12}alkylsulfonyl, C_1-C_{12}haloalkylthio, C_1-C_{12} haloalkylsulfinyl, C_1-C_{12}haloalkylsulfonyl, C_1-C_6alkoxy-C_1-C_6alkylthio, C_1-C_6alkoxy-C_1-C_6 alkylsulfinyl, C_1-C_6alkoxy-C_1-C_6alkylsulfonyl, C_2-C_{12}alkenylthio, C_2-C_{12}alkenylsulfinyl, C_2-C_{12} alkenylsulfonyl, C_2-C_{12}alkynylthio, C_2-C_{12}alkynylsulfinyl, C_2-C_{12}alkynylsulfonyl, C_2-C_{12} haloalkenylthio, C_2-C_{12}haloalkenylsulfinyl, C_2-C_{12}haloalkenylsulfonyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylthio, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfinyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfonyl, $(C_1$-C_4alkoxy$)_2P(O)O$, C_1-C_4alkyl-$(C_1$-C_4alkoxy$)P(O)O$, $H(C_1$-C_4alkoxy$)P(O)O$,

$R_{44}R_{45}N$, $R_{75}R_{76}NNH$-, $R_{46}R_{47}NC(O)O$-, $R_{77}R_{78}NC(O)NH$-, C_1-C_4alkyl-$S(O)_2NR_{48}$, C_1-C_4 haloalkyl-$S(O)_2NR_{49}$, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_{18}alkylcarbonyloxy, where the alkyl group may be substituted by halogen, C_1-C_6alkoxy, C_1-C_6alkylthio or cyano, C_2-C_{18}alkenylcarbonyloxy, C_2-C_{18}alkynylcarbonyloxy, C_3-C_6cycloalkylcarbonyloxy, C_1-C_{12} alkoxycarbonyloxy, C_1-C_{12}alkylthiocarbonyloxy, C_1-C_{12}alkylthiocarbamoyl, C_1-C_6alkyl-$NH(CS)N(C_1$-C_6alkyl$)$-NH-, di-C_1-C_6alkyl-$N(CS)N(C_1$-C_6alkyl$)$-NH-, benzyloxy, benzylthio,

benzylsulfinyl, benzylsulfonyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, phenylsulfonyloxy or benzoyloxy, where the phenyl groups for their part may each be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4 haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4alkyl-$S(O)_2N(C_1$-C_4 alkyl), halogen, nitro or cyano,

or a group Ar_6-thio, Ar_7-sulfinyl, Ar_8-sulfonyl, -OCO-Ar_9 or NH-Ar_{10} in which Ar_6, Ar_7, Ar_8, Ar_9 and Ar_{10} independently of one another are a five- to ten-membered monocyclic or fused bicyclic ring system which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, and in which each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms, and in which the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5 alkoxyalkylthio, C_3-C_5acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylsulfonyl, aminosulfonyl, C_1-C_2alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3alkylene-R_{50}, $NR_{51}R_{52}$, halogen, cyano, nitro, phenyl and benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, and where substituents on the nitrogen in the heterocyclic ring are different from halogen;

R_{50} is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3 alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

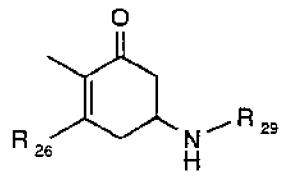
R_{51} is hydrogen or C_1-C_6alkyl;

R_{52} is C_1-C_6alkyl or C_1-C_6alkoxy;

R_{46}, R_{44} , R_{48} , R_{49}, R_{75} and R_{77} independently of one another are hydrogen or C_1-C_4alkyl;

R_{47}, R_{45}, R_{76} and R_{78} independently of one another are hydrogen, C_1-C_{12}alkyl, hydroxyl, C_1-C_{12}alkoxy, C_3-C_6alkenyloxy or C_3-C_6alkynyloxy; or R_{44} and R_{45} together or R_{46} and R_{47} together or R_{75} and R_{76} together or R_{77} and R_{78} together are pyrrolidino, piperidino, morpholino, thiomorpholino, which may be mono- or polysubstituted by methyl groups;

or are the group Q_3



(Q_3),

in which

R_{26} is hydroxyl, O^-M^+, halogen, cyano, SCN, OCN, C_1-C_{12}alkoxy, C_1-C_4alkoxycarbonyl-C_1-C_4alkoxy, C_1-C_{12}alkylthio, C_1-C_{12}alkylsulfinyl, C_1-C_{12}alkylsulfonyl, C_1-C_{12}haloalkylthio, C_1-C_{12}haloalkylsulfinyl, C_1-C_{12}haloalkylsulfonyl, C_1-C_6alkoxy-C_1-C_6alkylthio, C_1-C_6alkoxy-C_1-C_6alkylsulfinyl, C_1-C_6alkoxy-C_1-C_6alkylsulfonyl, C_2-C_{12}alkenylthio, C_2-C_{12}alkenylsulfinyl, C_2-C_{12}alkenylsulfonyl, C_2-C_{12}alkynylthio, C_2-C_{12}alkynylsulfinyl, C_2-C_{12}alkynylsulfonyl, C_2-C_{12}haloalkenylthio, C_2-C_{12}haloalkenylsulfinyl, C_2-C_{12}haloalkenylsulfonyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylthio, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfinyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfonyl, $(C_1$-C_4alkoxy$)_2P(O)O$, C_1-C_4alkyl-$(C_1$-C_4alkoxy$)P(O)O$, $H(C_1$-C_4alkoxy$)P(O)O$,

$R_{53}R_{54}N$, $R_{79}R_{80}NNH$-, $R_{55}R_{56}NC(O)O$-, $R_{81}R_{82}NC(O)NH$-, C_1-C_4alkyl-$S(O)_2NR_{57}$, C_1-C_4haloalkyl-$S(O)_2NR_{58}$, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_{18}alkylcarbonyloxy, where the alkyl group may be substituted by halogen, C_1-C_6alkoxy, C_1-C_6alkylthio or cyano, C_2-C_{18}alkenylcarbonyloxy, C_2-C_{18}alkynylcarbonyloxy, C_3-C_6cycloalkylcarbonyloxy, C_1-C_{12}alkoxycarbonyloxy, C_1-C_{12}alkylthiocarbonyloxy, C_1-C_{12}alkylthiocarbamoyl, C_1-C_6alkyl-NH(CS)N(C_1-C_6alkyl)-NH-, di-C_1-C_6alkyl-N(CS)N(C_1-C_6alkyl)-NH-, benzyloxy, benzylthio, benzylsulfinyl, benzylsulfonyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, phenylsulfonyloxy or benzoyloxy, where the phenyl groups for their part may each be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4alkyl-$S(O)_2N(C_1$-C_4alkyl), halogen, nitro or cyano,

or a group Ar_{11}-thio, Ar_{12}-sulfinyl, Ar_{13}-sulfonyl, -OCO-Ar_{14} or NH-Ar_{15} in which Ar_{11}, Ar_{12}, Ar_{13}, Ar_{14} and Ar_{15} independently of one another are a five- to ten-membered monocyclic or fused bicyclic ring system which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, and in

which each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms, and in which the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5 alkoxyalkylthio, C_3-C_5acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylsulfonyl, aminosulfonyl, C_1-C_2alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3alkylene-R_{59}, $NR_{60}R_{61}$, halogen, cyano, nitro, phenyl and benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, and where substituents on the nitrogen in the heterocyclic ring are different from halogen;

R_{59} is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3 alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

R_{60} is hydrogen or C_1-C_6alkyl;

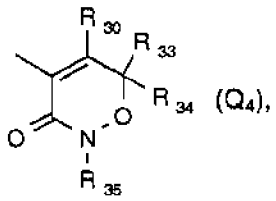
R_{61} is C_1-C_6alkyl or C_1-C_6alkoxy;

R_{55}, R_{53}, R_{57}, R_{58}, R_{79} and R_{81} independently of one another are hydrogen or C_1-C_4alkyl;

R_{56}, R_{54}, R_{80} and R_{82} independently of one another are hydrogen, C_1-C_{12}alkyl, hydroxyl, C_1-C_{12}alkoxy, C_3-C_6alkenyloxy or C_3-C_6alkynyloxy; or R_{53} and R_{54} together or R_{55} and R_{56} together or R_{79} and R_{80} together or R_{81} and R_{82} together are pyrrolidino, piperidino, morpholino, thiomorpholino, which may be mono- or polysubstituted by methyl groups;

R_{29} is hydrogen, C_1-C_6alkyl, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, (C_1-C_4alkyl)NHCO, phenylaminocarbonyl, benzylaminocarbonyl or (C_1-C_4alkyl)$_2$NCO, where the phenyl and benzyl groups for their part may each be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4 alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, C_1-C_4alkylamino, di-C_1-C_4 alkylamino, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4alkyl-S(O)$_2$O, C_1-C_4 haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4haloalkyl-S(O)$_2$O, C_1-C_4 alkyl-S(O)$_2$NH, C_1-C_4alkyl-S(O)$_2$N(C_1-C_4alkyl), halogen, nitro or cyano;

or is the group Q_4



(Q4),

in which

R_{30} is hydroxyl, O^-M^+, halogen, cyano, SCN, OCN, C_1-C_{12}alkoxy, C_1-C_4alkoxycarbonyl-C_1-C_4 alkoxy, C_1-C_{12}alkylthio, C_1-C_{12}alkylsulfinyl, C_1-C_{12}alkylsulfonyl, C_1-C_{12}haloalkylthio, C_1-C_{12} haloalkylsulfinyl, C_1-C_{12}haloalkylsulfonyl, C_1-C_6alkoxy-C_1-C_6alkylthio, C_1-C_6alkoxy-C_1-C_6 alkylsulfinyl, C_1-C_6alkoxy-C_1-C_6alkylsulfonyl, C_2-C_{12}alkenylthio, C_2-C_{12}alkenylsulfinyl, C_2-C_{12} alkenylsulfonyl, C_2-C_{12}alkynylthio, C_2-C_{12}alkynylsulfinyl, C_2-C_{12}alkynylsulfonyl, C_2-C_{12} haloalkenylthio, C_2-C_{12}haloalkenylsulfinyl, C_2-C_{12}haloalkenylsulfonyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylthio, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfinyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfonyl, $(C_1$-C_4alkoxy$)_2P(O)O$, C_1-C_4alkyl-(C_1-C_4alkoxy)$P(O)O$, $H(C_1$-C_4alkoxy$)P(O)O$,

$R_{62}R_{63}N$, $R_{83}R_{84}NNH$-, $R_{64}R_{65}NC(O)O$-, $R_{85}R_{86}NC(O)NH$-, C_1-C_4alkyl-$S(O)_2NR_{66}$, C_1-C_4 haloalkyl-$S(O)_2NR_{67}$, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_{18}alkylcarbonyloxy, where the alkyl group may be substituted by halogen, C_1-C_6alkoxy, C_1-C_6alkylthio or cyano, C_2-C_{18}alkenylcarbonyloxy, C_2-C_{18}alkynylcarbonyloxy, C_3-C_6cycloalkylcarbonyloxy, C_1-C_{12} alkoxycarbonyloxy, C_1-C_{12}alkylthiocarbonyloxy, C_1-C_{12}alkylthiocarbamoyl, C_1-C_6alkyl-NH(CS)N(C_1-C_6alkyl)-NH-, di-C_1-C_6alkyl-N(CS)N(C_1-C_6alkyl)-NH-, benzyloxy, benzylthio, benzylsulfinyl, benzylsulfonyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, phenylsulfonyloxy or benzoyloxy, where the phenyl groups for their part may each be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4 haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4alkyl-$S(O)_2N(C_1$-C_4 alkyl), halogen, nitro or cyano,

or a group Ar_{16}-thio, Ar_{17}-sulfinyl, Ar_{18}-sulfonyl, -OCO-Ar_{19} or NH-Ar_{20} in which Ar_{16}, Ar_{17}, Ar_{18}, Ar_{19} and Ar_{20} independently of one another are a five- to ten-membered monocyclic or fused bicyclic ring system which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, and in

which each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms, and in which the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5 alkoxyalkylthio, C_3-C_5acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylsulfonyl, aminosulfonyl, C_1-C_2alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3alkylene-R_{68}, $NR_{69}R_{70}$, halogen, cyano, nitro, phenyl and benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, and where substituents on the nitrogen in the heterocyclic ring are different from halogen;

R_{68} is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3 alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

R_{70} is hydrogen or C_1-C_6alkyl;

R_{61} is C_1-C_6alkyl or C_1-C_6alkoxy;

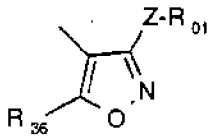
R_{64}, R_{62}, R_{66}, R_{67}, R_{83} and R_{85} independently of one another are hydrogen or C_1-C_4alkyl;

R_{65}, R_{63}, R_{84} and R_{86} independently of one another are hydrogen, C_1-C_{12}alkyl, hydroxyl, C_1-C_{12}alkoxy, C_3-C_6alkenyloxy or C_3-C_6alkynyloxy; or R_{62} and R_{63} together or R_{64} and R_{65} together or R_{83} and R_{84} together or R_{85} and R_{86} together are pyrrolidino, piperidino, morpholino, thiomorpholino, which may be mono- or polysubstituted by methyl groups;

R_{33} and R_{34} independently of one another are hydrogen, C_1-C_4alkyl, C_2-C_6alkenyl, C_2-C_6 alkynyl, C_1-C_4alkoxycarbonyl, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_4 alkyl-$NHS(O)_2$, C_1-C_4haloalkyl, -NH-C_1-C_4alkyl, -N(C_1-C_4alkyl)$_2$, C_1-C_6alkoxy or phenyl, which for its part may be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, amino, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_6 alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4 haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4 alkyl-$S(O)_2N(C_1$-C_4alkyl), halogen, nitro, COOH or cyano; or R_{33} and R_{34} together form a C_2-C_6alkylene bridge; and

R_{35} is hydrogen, C_1-C_6alkyl, C_3-C_6alkenyl, C_3-C_6alkynyl or benzyl, which for its part may be substituted by halogen, methyl or methoxy, or is C_1-C_4alkoxycarbonyl or phenyl, which for its part may be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4

alkylcarbonyl, C_1-C_4alkoxycarbonyl, amino, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_4 alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4 haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4 alkyl-$S(O)_2N(C_1$-C_4alkyl), halogen, nitro, COOH or cyano;
or is the group Q_5



(Q_5),

in which
Z is S, SO or SO_2;
R_{01} is hydrogen, C_1-C_8alkyl, C_1-C_8alkyl substituted by halogen, C_1-C_4alkoxy, C_1-C_4alkylthio, C_1-C_4alkylsulfonyl, C_1-C_4alkylsulfinyl, $-CO_2R_{02}$, $-COR_{03}$, $-COSR_{04}$, $-NR_{05}R_{06}$, $CONR_{036}R_{037}$ or phenyl, which for its part may be substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4 alkyl, (C_1-C_4alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4 alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, $N(C_1$-C_6alkyl)SO_2-C_1-C_4alkyl, $N(C_1$-C_6alkyl)SO_2-phenyl, $N(C_2$-C_6alkenyl)SO_2-C_1-C_4alkyl, $N(C_2$-C_6alkenyl)SO_2-phenyl, $N(C_3$-C_6alkynyl)SO_2-C_1-C_4alkyl, $N(C_3$-C_6alkynyl)SO_2-phenyl, $N(C_3$-C_7cycloalkyl)SO_2-C_1-C_4alkyl, $N(C_3$-C_7 cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{25}R_{26}$, OSO_2-C_1-C_4haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or $-NR_{015}CO_2R_{027}$;
or R_{01} is C_2-C_8alkenyl or C_2-C_8alkenyl substituted by halogen, C_1-C_4alkoxy, C_1-C_4alkylthio, C_1-C_4alkylsulfonyl, C_1-C_4alkylsulfinyl, $-CONR_{032}R_{033}$, cyano, nitro, -CHO, $-CO_2R_{036}$, $-COR_{039}$, -COS-C_1-C_4alkyl, $-NR_{034}R_{035}$ or phenyl which for its part may be substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, $N(C_1$-C_6alkyl)SO_2-C_1-C_4 alkyl, $N(C_1$-C_6alkyl)SO_2-phenyl, $N(C_2$-C_6alkenyl)SO_2-C_1-C_4alkyl, $N(C_2$-C_6alkenyl)SO_2-phenyl, $N(C_3$-C_6alkynyl)SO_2-C_1-C_4alkyl, $N(C_3$-C_6alkynyl)SO_2-phenyl, $N(C_3$-C_7cycloalkyl)SO_2-C_1-C_4

alkyl, N(C_3-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{040}R_{041}$, OSO_2-C_1-C_4haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or -$NR_{043}CO_2R_{042}$; or R_{01} is C_3-C_6alkynyl or C_3-C_6alkynyl substituted by halogen, C_1-C_4haloalkyl, cyano, -CO_2R_{044} or phenyl, which for its part may be substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, N(C_1-C_6alkyl)SO_2-C_1-C_4alkyl, N(C_1-C_6alkyl)SO_2-phenyl, N(C_2-C_6alkenyl)SO_2-C_1-C_4alkyl, N(C_2-C_6alkenyl)SO_2-phenyl, N(C_3-C_6alkynyl)SO_2-C_1-C_4alkyl, N(C_3-C_6alkynyl)SO_2-phenyl, N(C_3-C_7cycloalkyl)SO_2-C_1-C_4alkyl, N(C_3-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{028}R_{029}$, OSO_2-C_1-C_4haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or -$NR_{031}CO_2R_{030}$;
or R_{01} is C_3-C_7cycloalkyl, C_3-C_7cycloalkyl substituted by C_1-C_4alkyl, C_1-C_4alkoxy, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl or phenyl, which for its part may be substituted by halogen, nitro, cyano, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylthio, C_1-C_4haloalkylthio, C_1-C_4alkyl and C_1-C_4haloalkyl; or
R_{01} is C_1-C_4alkylene-C_3-C_7cycloalkyl, phenyl, or phenyl which is substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, N(C_1-C_6alkyl)SO_2-C_1-C_4alkyl, N(C_1-C_6alkyl)SO_2-phenyl, N(C_2-C_6alkenyl)SO_2-C_1-C_4alkyl, N(C_2-C_6alkenyl)SO_2-phenyl, N(C_3-C_6alkynyl)SO_2-C_1-C_4alkyl, N(C_3-C_6alkynyl)SO_2-phenyl, N(C_3-C_7cycloalkyl)SO_2-C_1-C_4alkyl, N(C_3-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{045}R_{046}$, OSO_2-C_1-C_4haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, or -$NR_{048}CO_2R_{047}$; or
R_{01} is C_1-C_4alkylene-phenyl, COR_{07} or 4-6-membered heterocyclyl;
R_{02}, R_{038}, R_{044} and R_{066} independently of one another are hydrogen, C_1-C_4alkyl, phenyl, or phenyl which is substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-

C_6alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4 alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, N(C_1-C_6alkyl)SO_2-C_1-C_4alkyl, N(C_1-C_6alkyl)SO_2-phenyl, N(C_2-C_6 alkenyl)SO_2-C_1-C_4alkyl, N(C_2-C_6alkenyl)SO_2-phenyl, N(C_3-C_6alkynyl)SO_2-C_1-C_4alkyl, N(C_3-C_6 alkynyl)SO_2-phenyl, N(C_3-C_7cycloalkyl)SO_2-C_1-C_4alkyl, N(C_3-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{049}R_{050}$, OSO_2-C_1-C_4 haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or -$NR_{052}CO_2R_{053}$;

R_{03}, R_{039} and R_{067} independently of one another are C_1-C_4alkyl, phenyl or phenyl which is substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6alkenyl, C_3-C_6 alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, N(C_1-C_6alkyl)SO_2-C_1-C_4alkyl, N(C_1-C_6alkyl)SO_2-phenyl, N(C_2-C_6alkenyl)SO_2-C_1-C_4alkyl, N(C_2-C_6alkenyl)SO_2-phenyl, N(C_3-C_6alkynyl)SO_2-C_1-C_4alkyl, N(C_3-C_6alkynyl)SO_2-phenyl, N(C_3-C_7 cycloalkyl)SO_2-C_1-C_4alkyl, N(C_3-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR0_{070}R_{054}$, OSO_2-C_1-C_4haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or -$NR_{058}CO_2R_{055}$;

R_{04} is C_1-C_4alkyl;

R_{05} is hydrogen, C_1-C_4alkyl, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_7cycloalkyl, phenyl or phenyl which is substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6 alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4 alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, N(C_1-C_6alkyl)SO_2-C_1-C_4alkyl, N(C_1-C_6alkyl)SO_2-phenyl, N(C_2-C_6 alkenyl)SO_2-C_1-C_4alkyl, N(C_2-C_6alkenyl)SO_2-phenyl, N(C_3-C_6alkynyl)SO_2H, N(C_3-C_6 alkynyl)SO_2-C_1-C_4alkyl, N(C_3-C_6alkynyl)SO_2-phenyl, N(C_3-C_7cycloalkyl)SO_2H, N(C_3-C_7 cycloalkyl)SO_2-C_1-C_4alkyl, N(C_3-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{057}R_{056}$, OSO_2-C_1-C_4haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl,

phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or -$NR_{060}CO_2R_{059}$;

R_{06} is hydrogen, C_1-C_4alkyl, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_7cycloalkyl, phenyl or phenyl which is substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6 alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4 alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, N(C_1-C_6alkyl)SO_2-C_1-C_4alkyl, N(C_1-C_6alkyl)SO_2-phenyl, N(C_2-C_6 alkenyl)SO_2-C_1-C_4alkyl, N(C_2-C_6alkenyl)SO_2-phenyl, N(C_3-C_6alkynyl)SO_2-C_1-C_4alkyl, N(C_3-C_6 alkynyl)SO_2-phenyl, N(C_3-C_7cycloalkyl)SO_2-C_1-C_4alkyl, N(C_3-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{061}R_{062}$, OSO_2-C_1-C_4 haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or -$NR_{064}CO_2R_{063}$;

R_{07} is phenyl, substituted phenyl, C_1-C_4alkyl, C_1-C_4alkoxy or -$NR_{08}R_{09}$;

R_{08} and R_{09} independently of one another are C_1-C_4alkyl, phenyl or phenyl which is substituted by halogen, nitro, cyano, C_1-C_4alkyl, C_1-C_4alkoxy, C_1-C_4thioalkyl, -CO_2R_{066}, -COR_{067}, C_1-C_4alkylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkyl; or R_{08} and R_{09} together form a 5-6-membered ring which may be interrupted by oxygen, NR_{065} or S,

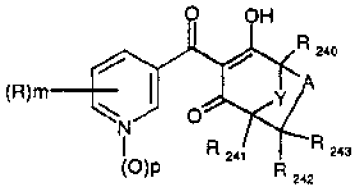
R_{015}, R_{031}, R_{043}, R_{048}, R_{052}, R_{056}, R_{060} and R_{064} independently of one another are hydrogen, C_1-C_4alkyl, C_2-C_6alkenyl, C_3-C_6alkynyl or C_3-C_7cycloalkyl;

R_{025}, R_{026}, R_{027}, R_{028}, R_{029}, R_{030}, R_{032}, R_{033}, R_{034}, R_{035}, R_{036}, R_{037}, R_{040}, R_{041}, R_{042}, R_{045}, R_{046}, R_{047}, R_{049}, R_{050}, R_{053}, R_{054}, R_{055}, R_{057}, R_{058}, R_{059}, R_{061}, R_{062}, R_{063}, R_{065} and R_{070} independently of one another are hydrogen, C_1-C_4alkyl, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_7cycloalkyl, phenyl, or phenyl which is substituted by halogen, nitro, cyano, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4 alkylthio, C_1-C_4haloalkylthio, C_1-C_4alkyl or C_1-C_4haloalkyl; and

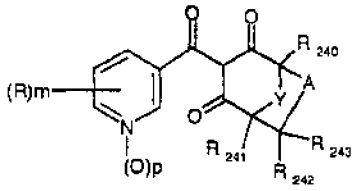
R_{36} is C_1-C_4alkyl, C_1-C_4haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6 haloalkynyl, C_3-C_6cycloalkyl or C_3-C_6cycloalkyl which is substituted by halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_4 alkoxycarbonyl, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4alkylcarbonyl, di-C_1-C_4alkylamino, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkyl-$S(O)_2O$ or phenyl which for its part may be substituted by halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_3-C_6alkenyl, C_3-C_6alkynyl,

cyano, nitro or COOH; and agronomically acceptable salts M^+ and all stereoisomers and tautomers of the compounds of the formula I.

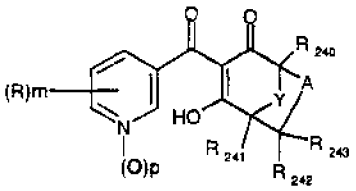
The compounds of the formula I can be present in different isomeric forms which can be isolated in pure form. The invention therefore also embraces all stereoisomeric forms of the compound of the formula I. Examples of these isomeric forms are the formulae Ix, Ixx, Ixxx and Ixxxx below, in which Q is the group Q_2.



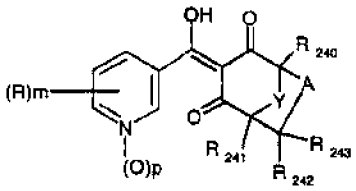
Ix



Ixx



Ixxx



Ixxxx

The alkyl groups occurring in the definitions of the substituents can be straight-chain or branched and are, for example, methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, iso-butyl, tert-butyl, pentyl, hexyl, heptyl and octyl and their branched isomers. Alkoxy, alkenyl and alkynyl radicals are derived from the alkyl radicals mentioned. The alkenyl and alkynyl groups can be mono- or polyunsaturated.

Halogen is generally fluorine, chlorine, bromine or iodine. This also applies, correspondingly, to halogen in combination with other meanings, such as haloalkyl or halophenyl.

Haloalkyl groups preferably have a chain length of from 1 to 8 carbon atoms. Haloalkyl is, for example, fluoromethyl, difluoromethyl, trifluoromethyl, chloromethyl, dichloromethyl, trichloromethyl, 2,2,2-trifluoroethyl, 2-fluoroethyl, 2-chloroethyl, pentafluoroethyl, 1,1-difluoro-2,2,2-trichloroethyl, 2,2,3,3-tetrafluoroethyl and 2,2,2-trichloroethyl; preferably

trichloromethyl, difluorochloromethyl, difluoromethyl, trifluoromethyl and dichlorofluoromethyl.

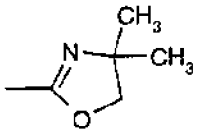
Suitable haloalkenyl groups are alkenyl groups which are mono- or polysubstituted by halogen, halogen being fluorine, chlorine, bromine and iodine and in particular fluorine and chlorine, for example 2,2-difluoro-1-methylvinyl, 3-fluoropropenyl, 3-chloropropenyl, 3-bromopropenyl, 2,3,3-trifluoropropenyl, 2,3,3-trichloropropenyl and 4,4,4-trifluorobut-2-en-1-yl. Among the C_3-C_{20}alkenyl groups which are mono-, di- or trisubstituted by halogen, preference is given to those having a chain length of from 3 to 5 carbon atoms.

Suitable haloalkynyl groups are, for example, alkynyl groups which are mono- or polysubstituted by halogen, halogen being bromine, iodine and in particular fluorine and chlorine, for example 3-fluoropropynyl, 3-chloropropynyl, 3-bromopropynyl, 3,3,3-trifluoropropynyl and 4,4,4-trifluorobut-2-yn-1-yl. Among the alkynyl groups which are mono- or polysubstituted by halogen, preference is given to those having a chain length of from 3 to 5 carbon atoms.

Alkoxy groups preferably have a chain length of from 1 to 6 carbon atoms. Alkoxy is, for example, methoxy, ethoxy, propoxy, i-propoxy, n-butoxy, isobutoxy, sec-butoxy and tert-butoxy and also the isomeric pentyloxy and hexyloxy radicals; preferably methoxy and ethoxy. Alkylcarbonyl is preferably acetyl or propionyl. Alkoxycarbonyl is, for example, methoxycarbonyl, ethoxycarbonyl, propoxycarbonyl, isopropoxycarbonyl, n-butoxycarbonyl, isobutoxycarbonyl, sec-butoxycarbonyl or tert-butoxycarbonyl; preferably methoxycarbonyl or ethoxycarbonyl. Haloalkoxy groups preferably have a chain length of from 1 to 8 carbon atoms. Haloalkoxy is, for example, fluoromethoxy, difluoromethoxy, trifluoromethoxy, 2,2,2-trifluoroethoxy, 1,1,2,2-tetrafluoroethoxy, 2-fluoroethoxy, 2-chloroethoxy, 2,2-difluoroethoxy and 2,2,2-trichloroethoxy; preferably difluoromethoxy, 2-chloroethoxy and trifluoromethoxy. Alkylthio groups preferably have a chain length of from 1 to 8 carbon atoms. Alkylthio is, for example, methylthio, ethylthio, propylthio, isopropylthio, n-butylthio, isobutylthio, sec-butylthio or tert-butylthio, preferably methylthio and ethylthio. Alkylsulfinyl is, for example, methylsulfinyl, ethylsulfinyl, propylsulfinyl, isopropylsulfinyl, n-butylsulfinyl, isobutylsulfinyl, sec-butylsulfinyl, tert-butylsulfinyl; preferably methylsulfinyl and ethylsulfinyl.

Alkylsulfonyl is, for example, methylsulfonyl, ethylsulfonyl, propylsulfonyl, isopropylsulfonyl, n-butylsulfonyl, isobutylsulfonyl, sec-butylsulfonyl or tert-butylsulfonyl; preferably methylsulfonyl or ethylsulfonyl. Alkoxyalkoxy groups preferably have a chain length of from 1 to 8 carbon atoms. Examples of alkoxyalkoxy groups are: methoxymethoxy, methoxyethoxy, methoxypropoxy, ethoxymethoxy, ethoxyethoxy, propoxymethoxy or butoxybutoxy. Alkylamino is, for example, methylamino, ethylamino, n-propylamino, isopropylamino or the isomeric butylamines. Dialkylamino is, for example, dimethylamino, methylethylamino, diethylamino, n-propylmethylamino, dibutylamino and diisopropylamino. Preference is given to alkylamino groups having a chain length of from 1 to 4 carbon atoms. Alkoxyalkyl groups have a chain length of preferably from 1 to 6 carbon atoms. Alkoxyalkyl is, for example, methoxymethyl, methoxyethyl, ethoxymethyl, ethoxyethyl, n-propoxymethyl, n-propoxyethyl, isopropoxymethyl or isopropoxyethyl. Alkylthioalkyl groups preferably have from 1 to 8 carbon atoms. Alkylthioalkyl is, for example, methylthiomethyl, methylthioethyl, ethylthiomethyl, ethylthioethyl, n-propylthiomethyl, n-propylthioethyl, isopropylthiomethyl, iso-propylthioethyl, butylthiomethyl, butylthioethyl or butylthiobutyl. The cycloalkyl groups preferably have from 3 to 8 ring carbon atoms, for example cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl and cyclooctyl. Phenyl, also as part of a substituent as phenoxy, benzyl, benzyloxy, benzoyl, phenylthio, phenylalkyl, phenoxyalkyl, may be substituted. In this case, the substituents can be in ortho, meta and/or para position. The preferred substituent positions are the ortho and para positions to the ring attachment point. Heterocyclyl is to be understood as meaning ring systems which, in addition to carbon atoms, contain at least one heteroatom, such as nitrogen, oxygen and/or sulfur. They can be saturated or unsaturated. In the context of the present invention, heterocyclyl ring systems may also be substituted. Suitable substituents are, for example, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, cyano, nitro, C_1-C_4alkylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4alkylthio or C_3-C_6cycloalkyl.

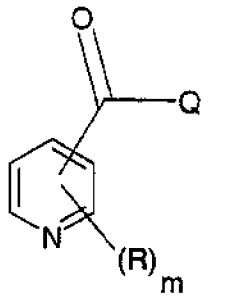
Heterocyclyl may be, for example, furyl, thiophenyl, pyrrolidyl, piperidinyl, morpholinyl, pyridyl, imidazolyl, tetrahydrofuryl, tetrahydropyranyl, dihydrofuryl, dihydropyranyl, isoxazolyl, oxazolyl, isothiazolyl, 1,2,3-thiadiazolyl, 1,2,4-thiadiazolyl, thiazolyl, pyrazolyl, 1,2,4-triazolyl, 1,2,3-triazolyl, tetrazolyl, pyrimidyl, pyrazinyl, sym. or unsym. triazinyl,

piperazinyl, oxazolinyl (for example: ), oxazolidinyl, imidazolinyl,

imidazolidinyl, dioxanyl, oxetanyl, in particular 2-oxetanyl, or phthalimidyl.

The invention also embraces the salts M^+ which can be formed by the compounds of the formula I, in particular the compounds of the formula I in which R_{20}, R_{23}, R_{26} and R_{30} are hydroxyl, preferably with amines, alkali metal and alkaline earth metal bases or quaternary ammonium bases. Among the alkali metal and alkaline earth metal bases, the hydroxides of lithium, sodium, potassium, magnesium or calcium, in particular those of sodium or potassium, may be especially emphasized as salt formers. Examples of amines suitable for ammonium salt formation are both ammonia and primary, secondary and tertiary C_1-C_{18}alkylamines, C_1-C_4hydroxyalkylamines and C_2-C_4alkoxyalkylamines, for example methylamine, ethylamine, n-propylamine, isopropylamine, the four isomeric butylamines, n-amylamine, isoamylamine, hexylamine, heptylamine, octylamine, nonylamine, decylamine, pentadecylamine, hexadecylamine, heptadecylamine, octadecylamine, methylethylamine, methylisopropylamine, methylhexylamine, methylnonylamine, methylpentadecylamine, methyloctadecylamine, ethylbutylamine, ethylheptylamine, ethyloctylamine, hexylheptylamine, hexyloctylamine, dimethylamine, diethylamine, di-n-propylamine, diisopropylamine, di-n-butylamine, di-n-amylamine, diisoamylamine, dihexylamine, diheptylamine, dioctylamine, ethanolamine, n-propanolamine, isopropanolamine, N,N-diethanolamine, N-ethylpropanolamine, N-butylethanolamine, allylamine, n-butenyl-2-amine, n-pentenyl-2-amine, 2,3-dimethylbutenyl-2-amine, dibutenyl-2-amine, n-hexenyl-2-amine, propylenediamine, trimethylamine, triethylamine, tri-n-propylamine, triisopropylamine, tri-n-butylamine, triisobutylamine, tri-sec-butylamine, tri-n-amylamine, methoxyethylamine and ethoxyethylamine; heterocyclic amiines, for example pyridine, quinoline, isoquinoline, morpholine, piperidine, pyrrolidine, indoline, quinuclidine and azepine; primary arylamines, for example anilines, methoxyanilines, ethoxyanilines, o,m,p-toluidines, phenylenediamines, naphthylamines and o,m,p-chloroanilines; but in particular triethylamine, isopropylamine and diisopropylamine. Quaternary ammonium bases which are suitable for salt formation are, for example, $[N(R_{a01}R_{b01}R_{c01}R_{d01})]^+ OH^-$, where R_{a01}, R_{b01}, R_{c01} and R_{d01} independently of one anotheer are C_1-C_4alkyl. Further suitable tetraalkylammonium bases with other anions can be obtained, for example, by anion exchange reactions.

Preferred compounds of the formula I correspond to the formula Ib



(Ib)

in which

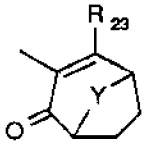
each R independently is C_1-C_6alkyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkylthio, C_1-C_6-alkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkyl, C_1-C_6haloalkylthio, C_1-C_6haloalkylsulfinyl, C_1-C_6haloalkylsulfonyl, C_1-C_6alkoxycarbonyl, C_1-C_6alkylcarbonyl, C_1-C_6alkylamino, di-C_1-C_6-alkylamino, C_1-C_6alkylaminosulfonyl, di-C_1-C_6alkylaminosulfonyl, -N(R_1)-S-R_2, -N(R_3)-SO-R_4, -N(R_5)-SO_2-R_6, nitro, cyano, halogen, hydroxyl, amino, or a five- to ten-membered monocyclic or fused bicyclic ring system which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, where the ring system is either attached directly to the pyridine ring or attached via a C_1-C_4alkylene group to the pyridine ring, and each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms, and the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5alkoxyalkylthio, C_3-C_5acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4-cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, aminosulfonyl, C_1-C_2alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3-alkylene-R_7, NR_8R_9, halogen, cyano, nitro, phenyl and benzylthio where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, and where substituents on the nitrogen in the heterocyclic ring are different from halogen;

Q is the group Q_1 in which

R_{20} is hydroxyl, C_1-C_4alkoxy, C_1-C_4alkylcarbonyloxy, C_1-C_4alkoxycarbonyloxy, $R_{21}R_{22}N$-C(O)O, phenylthio, C_1-C_4alkylthio, C_1-C_4alkyl-S(O)$_2$O, (C_1-C_4alkoxy)$_2$P(O)O, C_1-C_4alkyl(C_1-C_4alkoxy)P(O)O, H(C_1-C_4alkoxy)P(O)O or benzoyloxy; and

R_{21} and R_{22} independently of one another are hydrogen or C_1-C_4alkyl;

or the group Q_{2a}



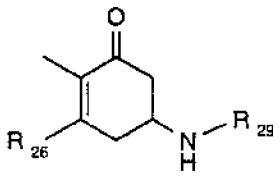
(Q_{2a}),

in which R_{23} is hydroxyl, C_1-C_4alkoxy, C_1-C_4alkylcarbonyloxy, C_1-C_4alkoxycarbonyloxy, $R_{24}R_{25}N$-C(O)O, phenylthio, C_1-C_4alkylthio, C_1-C_4alkyl-S(O)$_2$O, (C_1-C_4alkoxy)$_2$P(O)O, C_1-C_4-alkyl(C_1-C_4alkoxy)P(O)O, H(C_1-C_4alkoxy)P(O)O or benzoyloxy; and

R_{24} and R_{25} independently of one another are hydrogen or C_1-C_4alkyl; and

Y is oxygen, sulfur, a chemical bond or a C_1-C_4alkylene bridge;

or the group Q_3

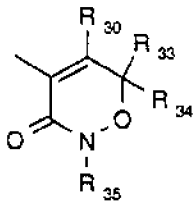


(Q_3),

in which R_{26} is hydroxyl, C_1-C_4alkoxy, C_1-C_4alkylcarbonyloxy, C_1-C_4alkoxycarbonyloxy, $R_{27}R_{28}N$-C(O)O, phenylthio, C_1-C_4alkylthio, C_1-C_4alkyl-S(O)$_2$O, (C_1-C_4alkoxy)$_2$P(O)O, C_1-C_4-alkyl(C_1-C_4alkoxy)P(O)O, H(C_1-C_4alkoxy)P(O)O or benzoyloxy; and

R_{27} and R_{28} independently of one another are hydrogen or C_1-C_4alkyl and

R_{29} is hydrogen, C_1-C_6alkyl, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, (C_1-C_4alkyl)NHCO or (C_1-C_4alkyl)$_2$NCO; or the group Q_4



(Q_4),

in which R_{30} is hydroxyl, C_1-C_4alkoxy, C_1-C_4alkylcarbonyloxy, C_1-C_4alkoxycarbonyloxy, $R_{31}R_{32}N$-C(O)O, phenylthio, C_1-C_4alkylthio, C_1-C_4alkyl-$S(O)_2O$, $(C_1$-C_4alkoxy$)_2P(O)O$, C_1-C_4-alkyl$(C_1$-C_4alkoxy$)P(O)O$, $H(C_1$-C_4alkoxy$)P(O)O$ or benzoyloxy; and

R_{31} and R_{32} independently of one another are hydrogen or C_1-C_4alkyl;

R_{33} and R_{34} independently of one another are hydrogen, C_1-C_4alkyl, C_2-C_6alkenyl, C_2-C_6alkynyl, C_1-C_4-alkoxycarbonyl, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_4alkyl-$NHS(O)_2$, C_1-C_4haloalkyl, -NH-C_1-C_4alkyl, -$N(C_1$-C_4alkyl$)_2$, C_1-C_6alkoxy, or phenyl which for its part may be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, amino, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_6alkylthio, C_1-C_6-alkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4alkyl-$S(O)_2N(C_1$-C_4-alkyl), halogen, nitro, COOH or cyano; or R_{33} and R_{34} together form a C_2-C_6alkylene bridge; and

R_{35} is hydrogen, C_1-C_4alkyl, C_1-C_4alkoxycarbonyl or phenyl which for its part may be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, amino, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_4alkylthio, C_1-C_4-alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4alkyl-$S(O)_2N(C_1$-C_4-alkyl), halogen, nitro, COOH or cyano; or the group Q_5, and also agronomically acceptable salts of these compounds, the other substituents being defined as under formula I in claim 1. Among the compounds of the formula Ib, preference is furthermore given to those in which the group
-C(O)-Q is located in the 3 position on the pyridine ring, or in which Q is Q_2, R_{23} being, in particular, hydroxyl, Y being a methylene bridge and m being the number 2. Preference is further given to compounds of the formula Ib in which R is C_1-C_6alkyl or C_1-C_6haloalkyl.

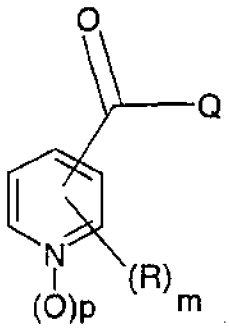
Preferred compounds of the formula I are characterized in that the group -C(O)Q is in the ortho position to a group R. Preference is furthermore given to compounds of the formula I in which a group R is C_1-C_6haloalkyl and in the ortho position to the pyridyl nitrogen. Of particular interest are furthermore compounds of the formula I in which the group -C(O)Q is in the 3 position to the pyridyl nitrogen. In the formula I, p is preferably the number 0. Also to be emphasized are compounds of the formula I in which m is 2 and R is C_1-C_3alkyl, C_1-C_3-haloalkyl, C_1-C_2alkoxymethyl, C_1-C_2alkythiomethyl, hydroxymethyl, C_1-C_6alkylcarbonyloxymethyl, benzoyloxymethyl, C_1-C_4alkoxycarbonyloxymethyl, chlorine, cyano, C_1-C_3alkoxy, C_1-C_3haloalkoxy, allyloxy, propargyloxy, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl, C_1-C_3alkylsulfonyloxy, C_1-C_2alkylsulfinylmethyl or C_1-C_2alkylsulfonylmethyl. A further group of preferred compounds of the formula I is formed by those compounds in which at least one group R is trifluoromethyl, difluorochloromethyl, pentafluoroethyl or heptafluoro-n-propyl.

Particularly noteworthy compounds of the formula I are those in which Q is a group Q_1 and R_{16}, R_{18} and R_{19} are C_1-C_3alkyl and R_{17} is hydrogen, or Q is a group Q_2 and Y is $-CH_2-$, $-CH_2CH_2-$ or oxygen, A is $-CH_2-$ and R_{240}, R_{241}, R_{242} and R_{243} are each hydrogen, or Q is a group Q_3 and R_{29} is C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl or C_1-C_4alkylaminocarbonyl or di(C_1-C_2-alkyl)aminocarbonyl, or Q is a group Q_4 in which R_{33}, R_{34} and R_{35} are C_1-C_3alkyl. In these noteworthy compounds of the formula I, R_{20}, R_{23}, R_{26} and R_{30} independently of one another are halogen, thiocyanato, C_1-C_{12}alkoxy, C_1-C_4alkoxycarbonyl-C_1-C_2alkoxy, C_1-C_{12}-

alkylthio, C_1-C_{12}alkylsulfinyl, C_1-C_{12}alkylsulfonyl, C_1-C_{12}haloalkylthio, C_1-C_{12}haloalkylsulfinyl, C_1-C_{12}haloalkylsulfonyl, C_1-C_{12}alkenylthio, C_2-C_{12}alkenylsulfinyl, C_2-C_{12}alkenylsulfonyl, C_2-C_{12}-haloalkenylthio, C_2-C_{12}haloalkenylsulfinyl, C_2-C_{12}haloalkenylsulfonyl, C_2-C_{12}alkynylthio, C_2-C_{12}alkynylsulfinyl, C_2-C_{12}alkynylsulfonyl, C_1-C_4alkoxycarbonyl-C_1-C_2-alkylthio, C_1-C_4-alkoxycarbonyl-C_1-C_2alkylsulfinyl, C_1-C_4alkoxycarbonyl-C_1-C_2alkylsulfonyl, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4haloalkyl-$S(O)_2NH$, C_1-C_4alkyl-$S(O)_2O$, C_1-C_{18}alkylcarbonyloxy, C_2-C_{18}-alkenylcarbonyloxy, C_3-C_6cycloalkylcarbonyloxy, C_1-C_{12}alkoxycarbonyloxy, C_1-C_{12}-alkylthiocarbonyloxy, C_1-C_{12}alkylthiocarbamoyl, C_1-C_6alkyl-NH(CS)N(C_1-C_6alkyl)-NH-, di-C_1-C_6alkyl-N(CS)N(C_1-C_6alkyl)-NH-, benzyloxy, benzylthio, benzylsulfinyl, benzylsulfonyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, phenylsulfonyloxy or benzoyloxy, where the phenyl groups for their part may in each case be substituted by C_1-C_4alkyl, C_1-C_4-haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, C_1-C_4-alkylamino, di-C_1-C_4alkylamino, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4-alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4-haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4alkyl-$S(O)_2N(C_1$-C_4alkyl), halogen, nitro or cyano, or R_{20}, R_{23}, R_{26} and R_{30} independently of one another are thienylcarbonyloxy or furylcarbonyloxy which for their part may be substituted by methyl or halogen, or are pyridylcarbonyloxy which for its part may be substituted as stated in claim 1, or R_{20} is $R_{37}R_{38}N$, $R_{71}R_{72}NNH$-, $R_{21}R_{22}NC(O)O$- or $R_{73}R_{74}NC(O)NH$-; or R_{23} is $R_{44}R_{45}N$, $R_{75}R_{76}NNH$-, $R_{46}R_{47}NC(O)O$- or $R_{77}R_{78}NC(O)NH$-; or R_{26} is $R_{53}R_{54}N$, $R_{79}R_{80}NNH$-, $R_{55}R_{56}NC(O)O$- or $R_{81}R_{82}NC(O)NH$-; or R_{30} is $R_{62}R_{63}N$, $R_{83}R_{84}NNH$-, $R_{64}R_{65}NC(O)O$- or $R_{85}R_{86}NC(O)NH$-. Very particularly preferably, R_{20}, R_{23}, R_{26} or R_{30} are hydroxyl or O^-M^+.

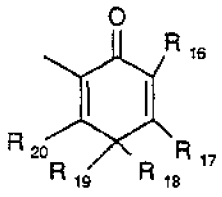
A further preferred group is formed by those compounds of the formula I in which Q is a group Q_5, R_{36} is C_1-C_4alkyl, C_1-C_4haloalkyl or cyclopropyl and R_{01} is C_1-C_6alkyl, C_1-C_4-alkoxycarbonylmethyl, C_3-C_8alkenyl, is benzyl or phenyl substituted by methyl, halogen, trifluoromethyl, methoxy, and at least one group R is trifluoromethyl, difluorochloromethyl, pentafluoroethyl or heptafluoro-n-propyl located in the ortho position to the pyridyl nitrogen.

The process according to the invention for preparing compounds of the formula I

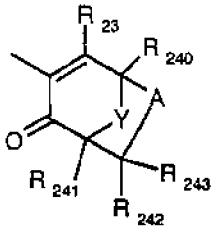


(I),

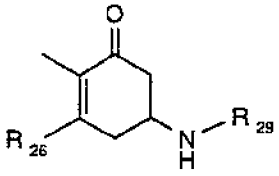
in which R and m are as defined under formula I; p is 0 and Q is the group



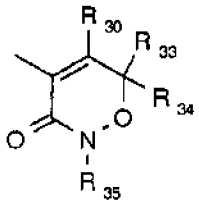
(Q_1),



(Q_2),



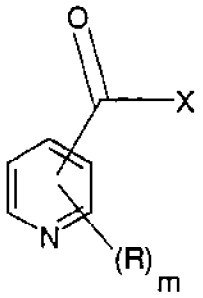
(Q_3) or



(Q_4)

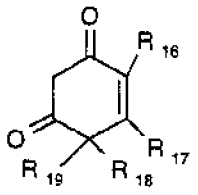
is carried out analogously to known processes (for example those described in WO 97/46530 and EP-A-0 353 187) and comprises

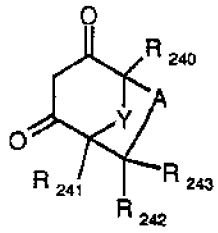
a) reacting a compound of the formula II

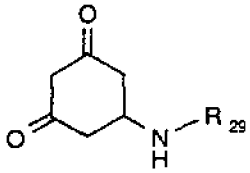


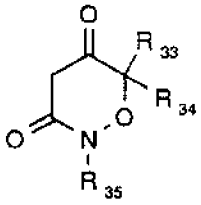
(II),

in which R and m are as defined under formula I and X is a leaving group, for example halogen, in an inert organic solvent in the presence of a base with compounds of the formula III, IV,V or VI

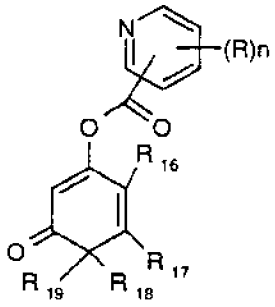
(III) 

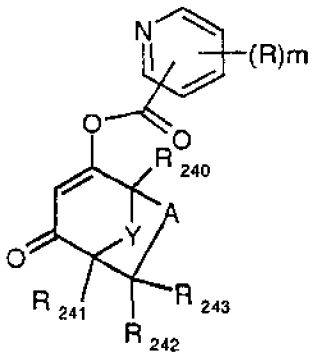
(IV) 

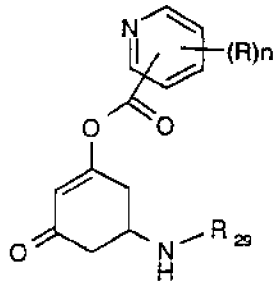
(V) 

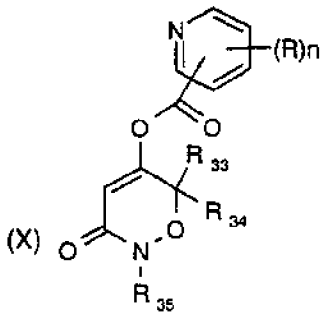
 (VI),

in which R_{16}, R_{17}, R_{18}, R_{19},R_{29}, R_{33}, R_{34}, R_{35}, R_{240}, R_{243}, R_{242}, R_{241}, A and Y are as defined under formula I to give the compounds of the formula VII, VIII, IX or X

(VII) 

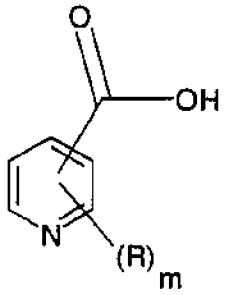
 (VIII)

(IX) 

(X) 

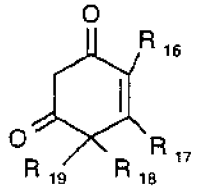
and then isomerizing these compounds, for example in the presence of a base and a catalytic amount of dimethylaminopyridine (DMAP) or a source of cyanide; or

b) reacting a compound of the formula XI

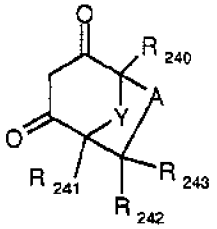


(XI),

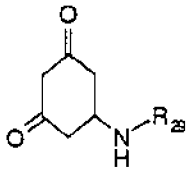
in which R and m are as defined under formula I with compounds of the formula III, IV, V or VI



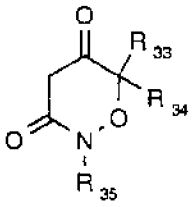
(III),



(IV),



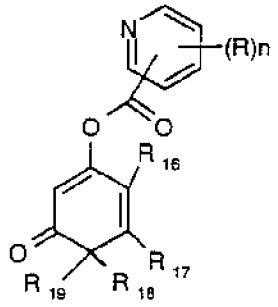
(V)



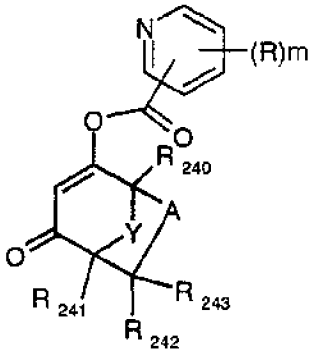
(VI),

in which R_{16}, R_{17}, R_{18}, R_{19}, R_{29}, R_{33}, R_{34}, R_{35}, R_{240}, R_{243}, R_{242}, R_{241}, A and Y are as defined under formula I in an inert organic solvent in the presence of a base and a coupling agent to give a compound of the formula VII, VIII, IX or X

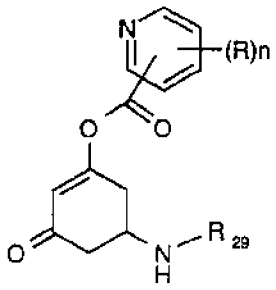
(VII)

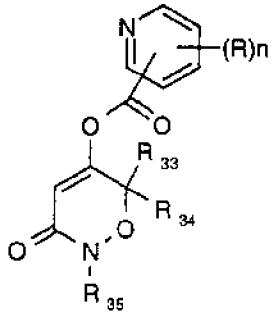


(VIII),



(IX)





(X)

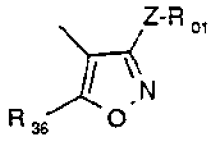
and then isomerizing these compounds, for example as described under route a).

Compounds of the formula I in which R_{20}, R_{23}, R_{26} and R_{30} are different from hydroxyl or halogen can be prepared by converesion methods which are generally known from the literature, for example acyclations or carbamoylations with appropriate acyl chlorides, from compounds in which R_{20}, R_{23}, R_{26} or R_{30} is hydroxyl in the presence of a suitable base, or they can be prepared by nucleophilic substitution reactions on chlorides of the formula I in which R_{20}, R_{23}, R_{26} or R_{30} is halogen, which are likewise obtainable by known processes by reaction with a chlorinating agent, such as phosgene, thionyl chloride or oxalyl chloride. Here, for example, suitably substituted amines, or hydroxylamines directly, or

alkylsulfonamides, mercaptans, thiophenols, phenols, Ar_1-NH_2 or Ar_1-SH, are employed in the presence of a base, for example 5-ethyl-2-methylpyridine, diisopropylethylamine, triethylamine, sodium bicarbonate, sodium acetate or potassium carbonate.

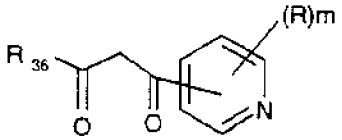
Compounds of the formula I in which R_{20}, R_{23}, R_{26} or R_{30} comprise thio groups can be oxidized analogously to known standard processes, for example using peracids, for example meta-chloroperbenzoic acid (m-CPBA) or peracetic acid, to give the corresponding sulfones and sulfoxides of the formula I. Here, the degree of oxidation at the sulfur atom (SO- or SO_2-) can be controlled by the amount of oxidizing agent.

The process according to the invention for preparing compounds of the formula I in which R and m are as defined under formula I and Q is a group



(Q5)

in which Z is sulfur, q is 0 and R_{36} and R_{01} are as defined under formula I is carried out analogously to known processes (for example those described in WO 97/43270) and comprises converting a compound of the formula XII

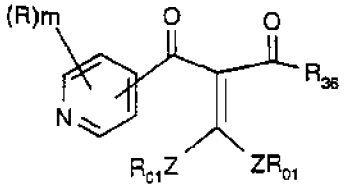


(XII),

in which R_{36}, R and m are as defined under formula I in the presence of a base, carbon disulfide and an alkylating agent of the formula XIII

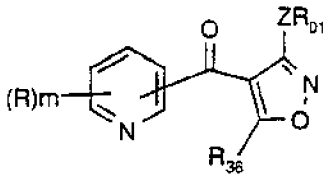
$$R_{01}\text{-}X_1 \qquad \text{(XIII)},$$

in which R_{01} is as defined under formula I and X_1 is a leaving group, for example halogen or sulfonate, into the compound of the formula XIV

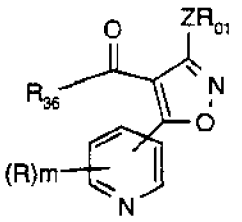


(XIV),

in which Z is sulfur and R, R_{01}, R_{36} and m are as defined above and then cyclizing this compound using hydroxylamine hydrochloride, in the presence or absence of a solvent, in the presence of a base to give the compounds of the formulae



(Ie) and



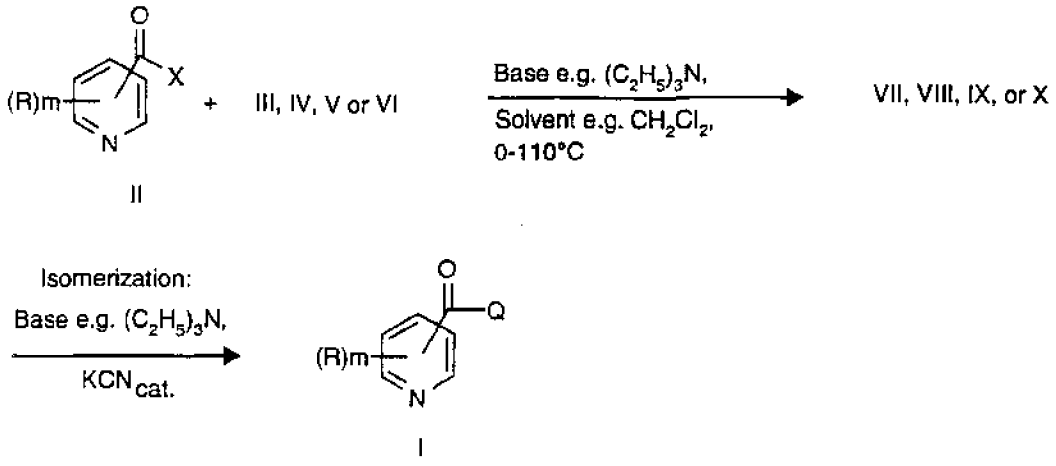
(If)

in which Z is sulfur and R, R_{36}, R_{01} and m are as defined above, and then oxidizing these compounds with an oxidizing agent, for example meta-chloroperbenzoic acid (m-CPBA). The isomers of the formulae Ie and If can be separated using column chromatography and a suitable mobile phase and then purified.

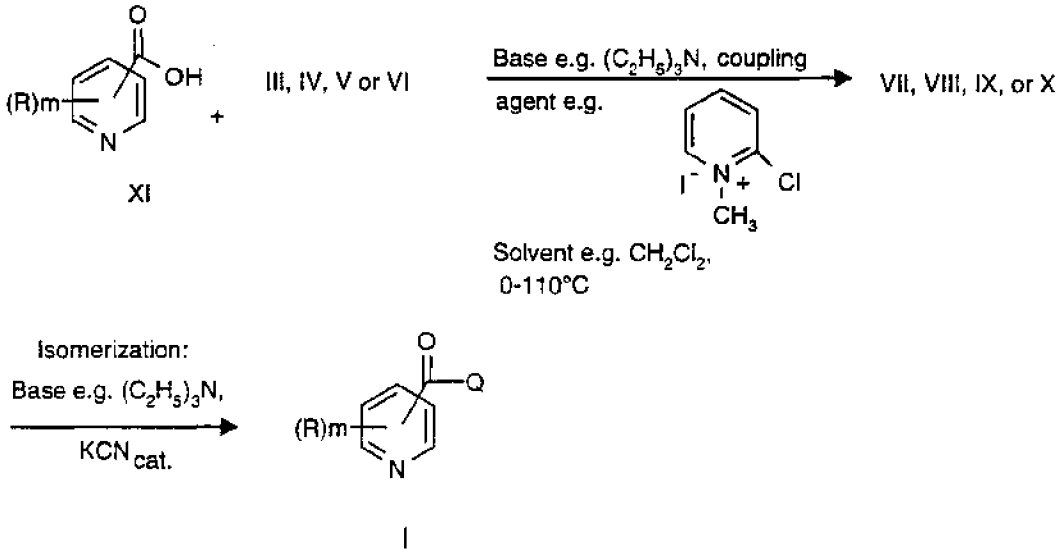
The preparation of the compounds of the formula I in which p is 0 is illustrated in more detail in the reaction schemes 1 and 2 below.

Reaction scheme 1

Route a):

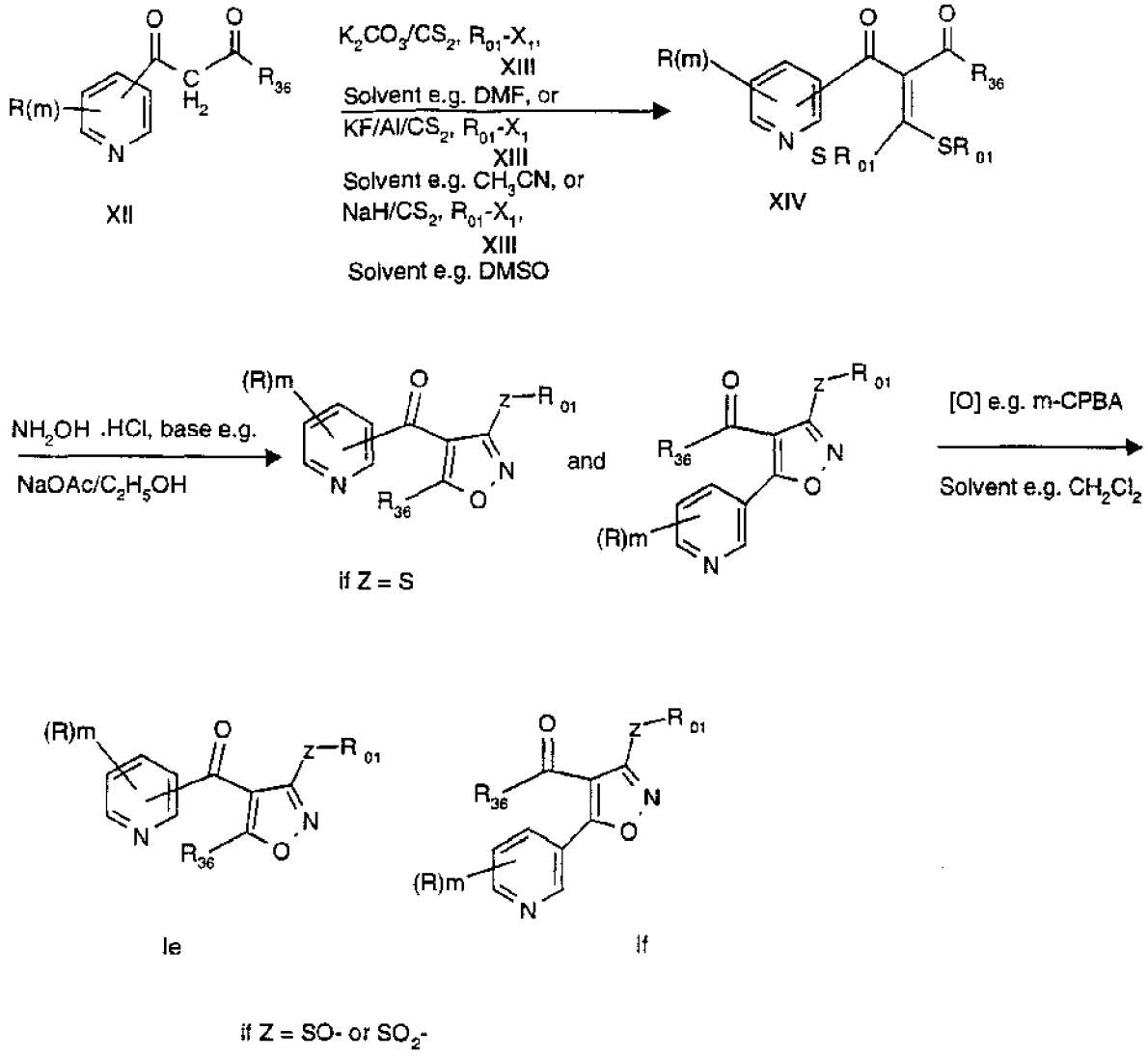


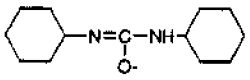
Route b):

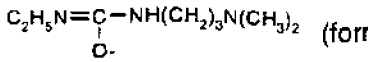


According to this reaction scheme, the compounds of the formula I with the group Q_1 in which R_{20} is hydroxyl, the compounds of the formula I with the group Q_2 in which R_{23} is hydroxyl, the compounds of the formula I with the group Q_3 in which R_{26} is hydroxyl and the compounds of the formula I with the group Q_4 in which R_{30} is hydroxyl can preferably be prepared.

Reaction scheme 2



For preparing the compounds of the formula I in which Q is the groups Q_1 to Q_4 and R_{20}, R_{23},R_{26} and R_{30} are hydroxyl, in accordance with reaction scheme 1, route a), the carboxylic acid derivatives of the formula II in which X is a leaving group, for example halogen, for example iodine, bromine and in particular chlorine, N-oxyphthalimide or N,O-dimethylhydroxylamino or part of an activated ester, for example  (formed from dicyclohexylcarbodiimide (DCC) and the corresponding carboxylic acid) or

 (formed from N-ethyl-N'-(3-dimethylaminopropyl)carbodiimide (EDC) and the corresponding carboxylic acid) are employed. These compounds are reacted in an inert organic solvent, for example a halogenated hydrocarbon, for example dichloromethane, a nitrile, for example acetonitrile, or an aromatic hydrocarbon, for example toluene, and in the presence of a base, for example an alkylamine, for example triethylamine, an aromatic amine, for example pyridine or 4-dimethylaminopyridine (DMAP), with the dione derivatives of the formula III, IV, V or VI to give the isomeric enol ethers of the formulae VII, VIII, IX and X. This esterification is carried out at temperatures of from 0°C to 110°C.

The isomerization of the ester derivatives of the formulae VII, VIII, IX and X to the dione derivatives of the formula I (in which R_{20}, R_{23}, R_{26} and R_{30} are hydroxyl) can be carried out, for example, analogously to EP 369 803 in the presence of a base, for example an alkylamine, for example triethylamine, a carbonate, for example potassium carbonate, and a catalytic amount of DMAP or a cyanide source, for example acetone cyanohydrin or potassium cyanide.

According to reaction scheme 1, route b), the desired diones of the formula I (in which R_{20}, R_{23}, R_{26} and R_{30} are hydroxyl) can be obtained, for example, in analogy to Chem. Lett. 1975, 1045 by esterifying the carboxylic acids of the formula XI with the dione derivatives of the formula III, IV, V or VI in an inert solvent, for example a halogenated hydrocarbon, for example dichloromethane, a nitrile, for example acetonitrile, or an aromatic hydrocarbon, for example toluene, in the presence of a base, for example an alkylamine, for example triethylamine, and a coupling agent, for example 2-chloro-1-methylpyridinium iodide. Depending on the solvent used, this esterification is carried out at temperatures of from 0°C to 110°C, affording initially, as described under route a), the isomeric ester of the formula I which can be isomerized as described under route a), for example in the presence of a base and a catalytic amount of DMAP, or a cyanide source, to give the desired dione derivative of the formula I (R_{20}, R_{23}, R_{26} and R_{30} are hydroxyl).

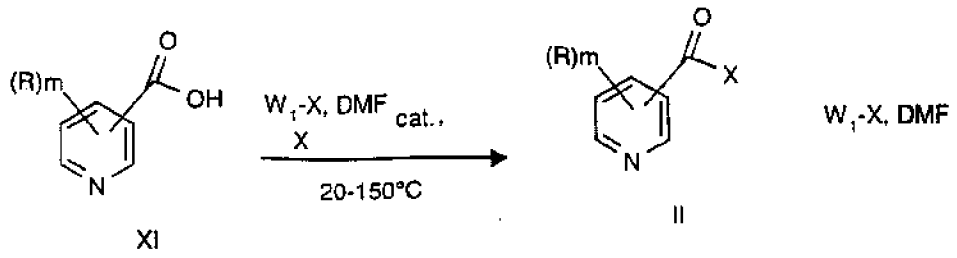
The preparation of the compounds of the formula I in which Q is the group Q_5 can be carried out in accordance with reaction scheme 2 by reacting the β-diketone derivative of

the formula XII, for example in analogy to Synthesis 1991, 301; ibid. 1988, 793; or Tetrahedron 32, 3055 (1976) with carbon disulfide in the presence of a base, for example a carbonate, for example potassium carbonate, a metal hydride, for example sodium hydride, or potassium fluoride on aluminium, and an alkylating agent of the formula XIII in which X_1 is a leaving group, for example halogen, for example iodine, bromine and in particular chlorine, $R_{25}OSO_2O$-, CH_3SO_2O- or  . This reaction is preferably carried out in the presence of a solvent, for example an amide, for example N,N-dimethylformamide (DMF), a sulfoxide, for example dimethylsulfoxide (DMSO), or a nitrile, for example acetonitrile. The ketene thioacetal of the formula XIV which is formed is cyclized with the aid of hydroxylamine hydrochloride in the presence of a base, for example sodium acetate, in a solvent, for example an alcohol, for example ethanol, or an ether, for example tetrahydrofuran, to give the compound of the formula Ie in which Z is sulfur. This cyclization reaction is carried out at temperatures of from 0°C to 100°C. If appropriate, compounds of the formulae Ie and If (Z is sulfur) can be oxidized analogously to known standard processes, for example with peracids, for example meta-chloroperbenzoic acid (m-CPBA) or peracetic acid, to give the corresponding sulfones and sulfoxides of the formulae Ie and If (Z = SO- or SO_2-). Here, the degree of oxidation at the sulfur atom (Z = SO- or SO_2-) can be controlled by the amount of oxidizing agent.

Oxidations to the compounds of the formulae Ie and If (Z is SO- or SO_2-) are carried out as described, for example, in H.O. House, "Modern Synthetic Reactions" W. A. Benjamin, Inc., Menlo Park, California, 1972, pages 334-335 and 353-354.

The activated carboxylic acid derivatives of the formula II in reaction scheme 1 (route a) in which X is a leaving group, for example halogen, for example bromine, iodine or in particular chlorine, can be prepared by known standard processes, as described, for example, in C. Ferri "Reaktionen der organischen Synthese" [Reactions of Organic Synthesis], Georg Thieme Verlag, Stuttgart, 1978, page 461 ff. This is shown in reaction scheme 3 below.

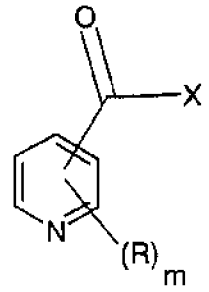
Reaction scheme 3



According to reaction scheme 3, the compounds of the formula II (X=leaving group) or II (X=halogen) are prepared, for example, by employing a halogenating agent, for example a thionyl halide, for example thionyl chloride or thionyl bromide; a phosphorus halide or phosphorus oxyhalide, for example phosphorus pentachloride or phosphorus oxychloride or phosphorus pentabromide or phosphoryl bromide; or an oxalyl halide, for example oxalyl chloride, or by employing a reagent for the formation of activated esters, for example N,N'-dicyclohexylcarbodiimide (DCC) or N-ethyl-N'-(3-dimethylaminopropyl)carbodiimide (EDC) of the formula X. For the compound of the formula X used as halogenating agents, X is a leaving group, for example halogen, for example fluorine, bromine or iodine and in particular chlorine, and W_1 is, for example, PCl_2, SOCl, SOBr or ClCOCO.
The reaction is carried out in the presence or absence of an inert organic solvent, for example in aliphatic, halogenated aliphatic, aromatic or halogenated aromatic hydrocarbons, for example n-hexane, benzene, toluene, xylenes, dichloromethane, 1,2-dichloroethane or chlorobenzene, at reaction temperatures in the range of from -20°C to the reflux temperature of the reaction mixture, preferably at 40-150°C, and in the presence of a catalytic amount of N,N-dimethylformamide. Such reactions are generally known and described in the literature in various variations with respect to the leaving group X.

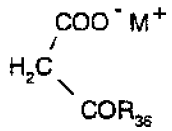
The compounds of the formulae III, IV, V and VI are known and can be prepared analogously to the methods described, for example, in WO 92/07837, DE-A-3818958, EP-A-0 338 992 and DE-A-3902818.

The compounds of the formula XII in reaction scheme 2 can be obtained by standard processes, for example from the corresponding compounds of the formula II



(II),

in which R and m are as defined above and X is a leaving group, for example halogen, for example via Claisen condensation, or from the compounds of the formula II by reaction with a ketocarboxylic acid salt of the formula XV



(XV),

in which R_{36} is as defined under formula I and M^+ is an alkali metal ion (cf., for example, WO 96/26192).

The compounds of the formulae II and XI are known and can be prepared analogously to the methods described, for example, in WO 97/46530, EP-A-0 353 187, Heterocycles, 48, 779 (1998), Heterocycles, 46, 129 (1997), or Tetrahedron Letters, 1749 (1998).

For preparing all other compounds of the formula I functionalized according to the definition of $(R)_m$, there is a large number of known standard processes available, for example alkylation, halogenation, acylation, amidation, oximation, oxidation and reduction, and the choice of the suitable preparation processes depends on the properties (reactivities) of the substituents in the intermediates in question.

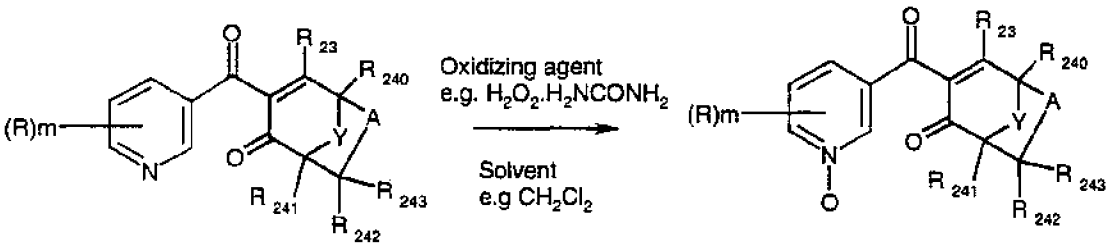
All further compounds originating from the scope of the formula I can be prepared in a simple manner, taking into account the chemical properties of the pyridyl or Q moiety.

The end products of the formula I can be isolated in a customary manner by concentration or evaporation of the solvent and be purified by recrystallization or trituration of the solid residue in solvents in which they are only sparingly soluble, such as ethers, aromatic

hydrocarbons or chlorinated hydrocarbons, by distillation or by means of column chromatography and a suitable mobile phase.

Furthermore, it is known to the person skilled in the art in which order certain reactions have to be carried out advantageously to avoid possible side reactions. Unless a targeted synthesis is carried out for isolating pure isomers, the product may be obtained as a mixture of two or more isomers. The isomers can be separated by methods known per se.

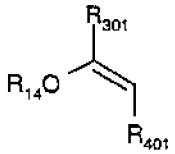
Compounds of the formula I in which p is 1, i.e. the corresponding N-oxides of the formula I, can be prepared by reacting a compound of the formula I in which p is 0 with a suitable oxidizing agent, for example with the H_2O_2 urea adduct, in the presence of an acid anhydride, for example trifluoroacetic anhydride. This reaction sequence is demonstrated using the example of group Q_2 below:



Compounds of the formula I in which R in the ortho position to the pyridine nitrogen is 1-chloro-C_1-C_2alkyl, 1-hydroxy-C_1-C_2alkyl, 1-(C_1-C_6alkylcarbonyloxy)-C_1-C_2alkyl, 1-benzoyloxy-C_1-C_2alkyl, 1-(C_1-C_4alkoxycarbonyloxy)-C_1-C_2alkyl, 1-(C_1-C_4alkylthio)-C_1-C_2alkyl, 1-(C_1-C_4-alkylsulfinyl)-C_1-C_2alkyl, 1-(C_1-C_4alkylsulfonyl)-C_1-C_2alkyl, 1-thiocyanato-C_1-C_2alkyl, 1-cyano-C_1-C_2alkyl, can also be prepared, for example, by heating an N-oxide of the formula I under known reaction conditions, for example in the presence of tosyl chloride (see, for example, Parham, W. E.; Sloan, K. B.; Reddy, K. R.; Olson, P. E.; *J Org Chem* 1973, **38**, 927) or in the presence of an acid anhydride (see, for example, Konno, K.; Hashimoto, K.; Shirahama, H.; Matsumoto, T.; *Heterocycles* 1986, 24, 2169), followed, if appropriate, by subsequent conversion.

The compounds of the formula XXIIa are synthesized analogously to known processes, for example those mentioned in Heterocycles, 46, 129 (1997) or Helvetica Chimica Acta 71, 596 (1988), and comprises either

a) acylating a compound of the formula XVI



(XVI),

in which R_{301} is hydrogen or C_1-C_6alkyl;

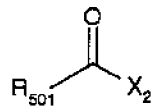
R_{401} is hydrogen, C_1-C_6alkyl ,C_2-C_6alkenyl, C_3-C_6cycloalkyl, C_1-C_6alkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6haloalkyl, 1-(C_1-C_6alkylcarbonyloxy)-C_1-C_6alkyl, 1-(C_1-C_6alkylthio)-C_1-C_6-alkyl, 1-(C_1-C_6alkylsulfinyl)-C_1-C_6alkyl, 1-(C_1-C_6alkylsulfonyl)-C_1-C_6alkyl, 1-thiocyanato-C_1-C_6-alkyl, 1-cyano-C_1-C_6alkyl, phenyl, where the phenyl groups may be mono- or polysubstituted by halogen, methyl, ethyl, trifluoromethyl, methoxy or nitro, or is a five- to ten-membered monocyclic or fused bicyclic ring system which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, where the ring system is either attached directly or via a C_1-C_4alkylene group to the double bond, and each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms and the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5alkoxyalkylthio, C_3-C_5acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylsulfonyl, aminosulfonyl, C_1-C_2alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3alkylene-R_{87}, $NR_{88}R_{89}$, halogen, cyano, nitro, phenyl and benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3-haloalkoxy, halogen, cyano or nitro and where substituents on nitrogen in the heterocyclic ring are different from halogen;

R_{87} is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3-alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

R_{88} is hydrogen or C_1-C_6alkyl and

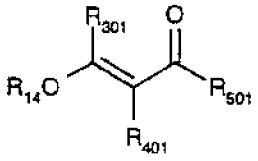
R_{89} is C_1-C_6alkyl or C_1-C_6alkoxy;

with a compound of the formula XVII



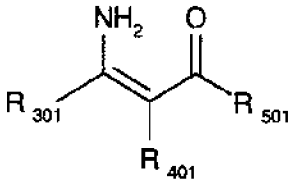
(XVII),

in which R_{501} is C_1-C_6haloalkyl and X_2 is $O(CO)R_{501}$ or halogen to give the compound of the formula XVIII



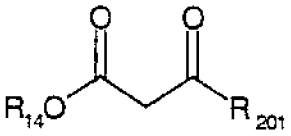
(XVIII),

in which R_{301}, R_{401}, R_{501} and R_{14} are as defined above, in the presence of a base, for example an aromatic amine, for example pyridine, and subsequently replacing the alkoxy group by the amino group using ammonia in an organic solvent, for example a halogenated hydrocarbon, for example dichloromethane, or a nitrile, for example acetonitrile. The resulting compound of the formula XIX



(XIX)

is subsequently condensed with a compound of the formula XX



(XX),

in which R_{201} is C_1-C_8alkyl, C_2-C_6alkenyl, C_2-C_8haloalkenyl, C_2-C_6alkynyl, C_2-C_6-haloalkynyl, C_3-C_6cycloalkyl, C_1-C_6haloalkyl, 1-(C_1-C_6alkylcarbonyloxy)-C_1-C_6alkyl, 1-(C_1-C_6alkylthio)-C_1-C_6alkyl, 1-(C_1-C_6alkylsulfinyl)-C_1-C_6alkyl, 1-(C_1-C_6alkylsulfonyl)-C_1-C_6alkyl, 1-thiocyanato-C_1-C_6alkyl, 1-cyano-C_1-C_6alkyl, C_1-C_6alkoxy-C_1-C_6alkyl, C_1-C_6alkoxycarbonyl-C_1-C_6alkoxy, C_1-C_6alkylthio-C_1-C_6alkoxy, phenyl, benzyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzylthio, benzylsulfinyl or benzylsulfonyl, where the phenyl groups may be mono- or polysubstituted at least by halogen, methyl, ethyl, trifluoromethyl, methoxy or nitro, or is a five- to ten-membered monocyclic or fused bicyclic ring system which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, where the ring system is attached either directly or via a C_1-

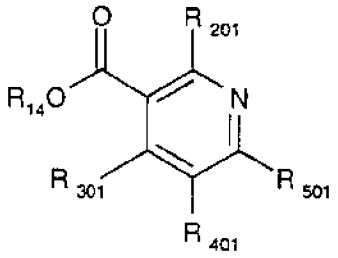
C_4-alkylene group and each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms, and the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5alkoxyalkylthio, C_3-C_5acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylsulfonyl, aminosulfonyl, C_1-C_2alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3-R_{90}, $NR_{91}R_{92}$, halogen, cyano, nitro, phenyl and benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3-haloalkoxy, halogen, cyano or nitro, and where substituents on nitrogen in the heterocyclic ring are different from halogen;

R_{90} is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3-alkyl, C_1-C_3haloalkyl, C_1-C_3-alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

R_{91} is hydrogen or C_1-C_6alkyl and

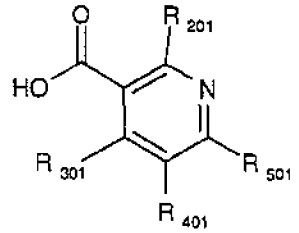
R_{92} is C_1-C_6alkyl or C_1-C_6alkoxy and

R_{14} is as defined above, and the resulting compound of the formula XXIa



(XXIa)

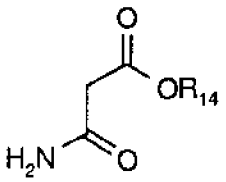
is subsequently hydrolysed to give the compound of the formula XXIIa



(XXIIa),

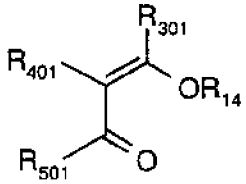
in which R_{201}, R_{301}, R_{401} and R_{501} are as defined above, or

b) condensing a compound of the formula XXIII



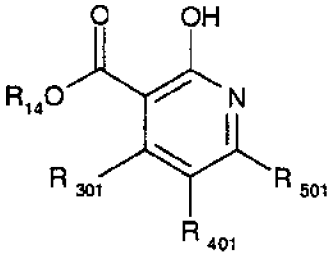
(XXIII),

in which R_{14} is as defined above with a compound of the formula XXIV



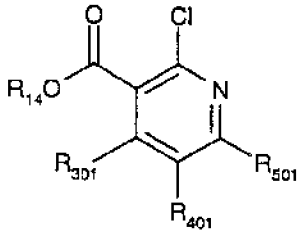
(XXIV)

and chlorinating the resulting compound of the formula XXV



(XXV)

in which R_{301}, R_{401} and R_{501} are as defined above and R_{14} is C_1-C_4alkyl to give compounds of the formula XXVI



(XXVI)

in which R_{301}, R_{401}, R_{501} and R_{14} are as defined above (using, for example, $POCl_3$), and subsequently reacting this compound with a nucleophile of the formula XXVII

$$Z\text{-}R_{150} \quad \text{(XXVII)}$$

In which Z is SH, OH or amino and R_{150} is C_1-C_6alkyl, C_3-C_6alkenyl, C_3-C_6halogenalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkyl, phenyl, benzyl, where the phenyl and benzyl groups for their part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, is C_1-C_4alkoxy-C_1-C_4alkyl or C_1-C_4-alkylthio-C_1-C_4alkyl , C_1-C_4alkylsulfinyl-C_1-C_4alkyl, C_1-C_4alkylsulfonyl-C_1-C_4alkyl, or a five- to

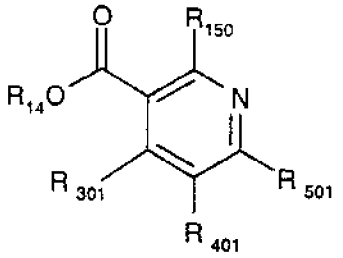
ten-membered monocyclic or fused bicyclic ring system which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, and each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms, and the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6-alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6-alkynylthio, C_2-C_5alkoxyalkylthio, C_3-C_5acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4-cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6-haloalkylsulfonyl, aminosulfonyl, C_1-C_2alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3-alkylene-R_{93}, $NR_{94}R_{95}$, halogen, cyano, nitro, phenyl and benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3-haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, and where substituents on nitrogen in the heterocyclic ring are different from halogen;

R_{93} is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3-alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

R_{94} is hydrogen or C_1-C_6alkyl and

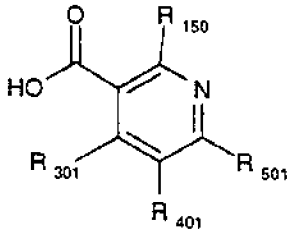
R_{95} is C_1-C_6alkyl or C_1-C_6alkoxy;

in the presence of a base to give compounds of the formula XXIb



(XXIb),

in which R_{14}, R_{150}, R_{301}, R_{401} and R_{501} are as defined above, and subsequently hydrolysing the resulting compound to give the compound of the formula XXIIb

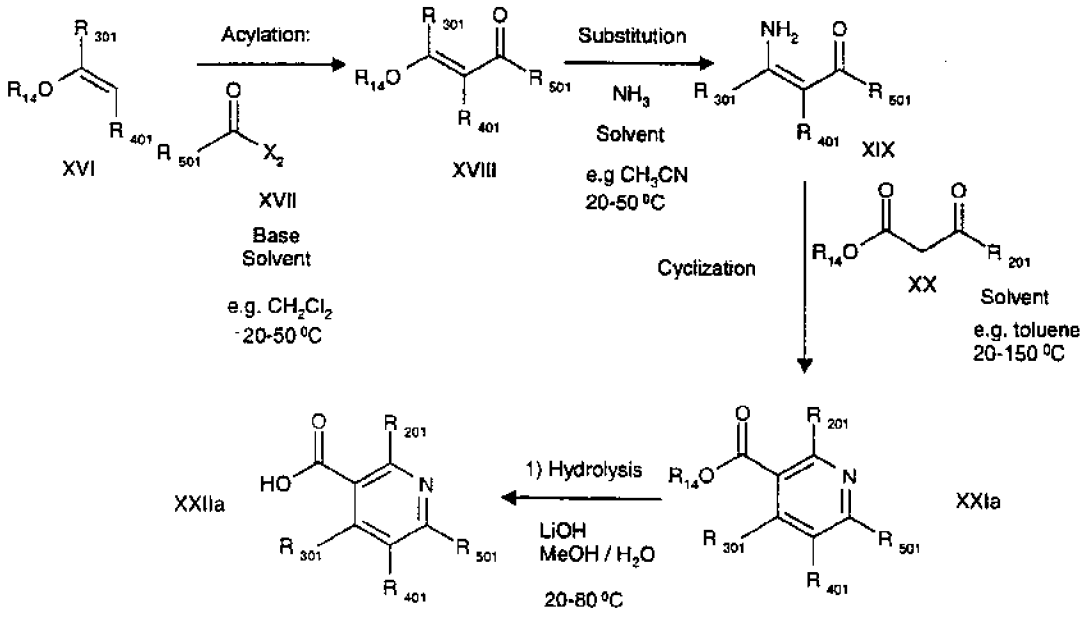


(XXIIb),

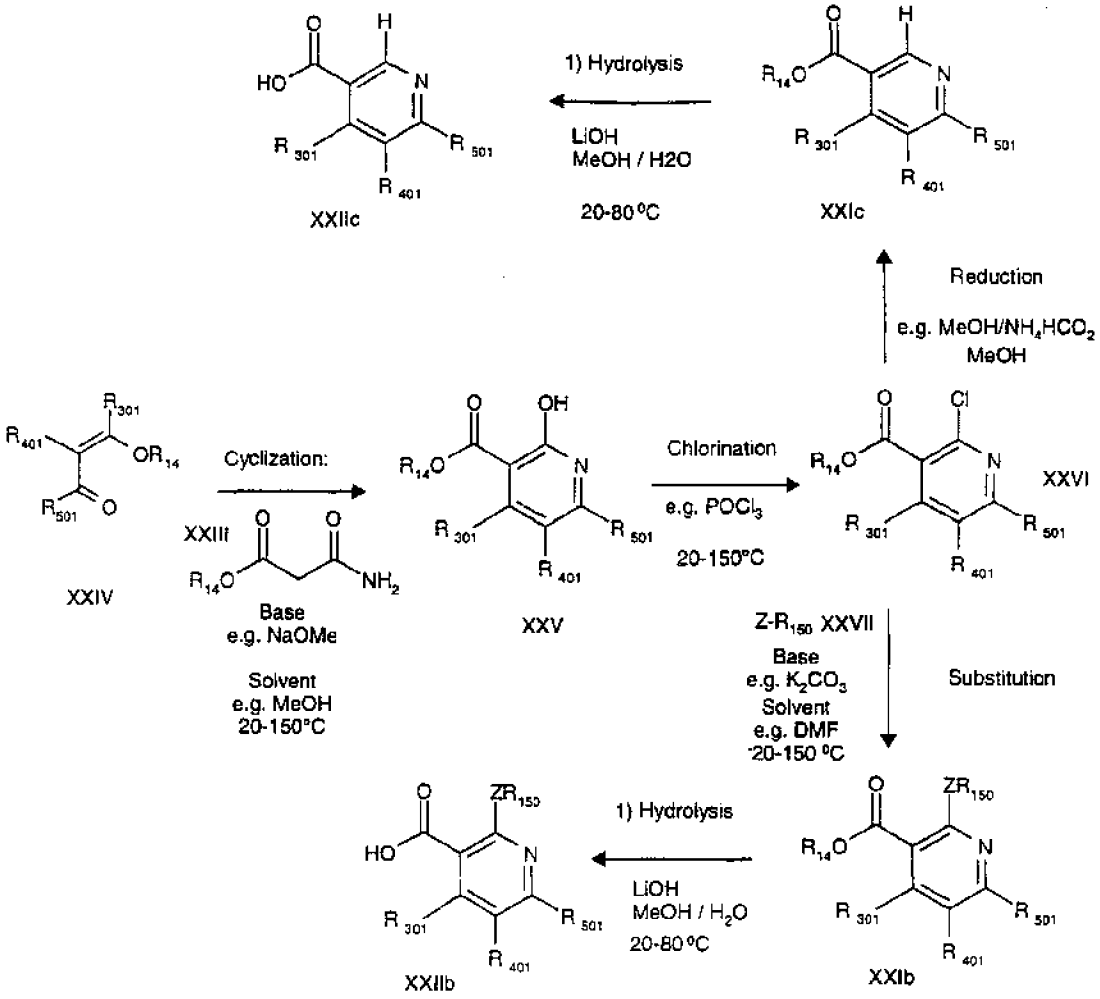
in which R_{150}, R_{301}, R_{401} and R_{501} are as defined.

Compounds of the formula XXIb in which R_{150} is fluorine are prepared by reacting a compound of the formula XXVI in the presence of a polar aprotic solvent, for example acetonitrile, dimethylformamide or sulfolane, with potassium fluoride in the presence or absence of a catalytic amount of 18-crown-6. Compounds of the formula XXIc in which R_{150} is hydrogen are preparerd by reducing the chlorine group in the formula XXVI, for example using hydrogen in the presence of a suitable metal catalyst or using ammonium formate in a suitable solvent. The preparation of the compounds of the formula XXIIa, or XXIIb and XXIIc is illustrated in more detail in the reaction schemes 4 and 5 below.

Reaction scheme 4



Reaction scheme 5:



For preparing all other compounds of the formula I which are functionalized according to the definition of R_{201} (R_{150}) to R_{501}, a large number of known standard processes is suitable, for example alkylation, halogenation, acylation, amidation, oximation, oxidation and reduction, the choice of the suitable preparation processes depending on the properties (reactivities) of the substituents in the intermediates in question.

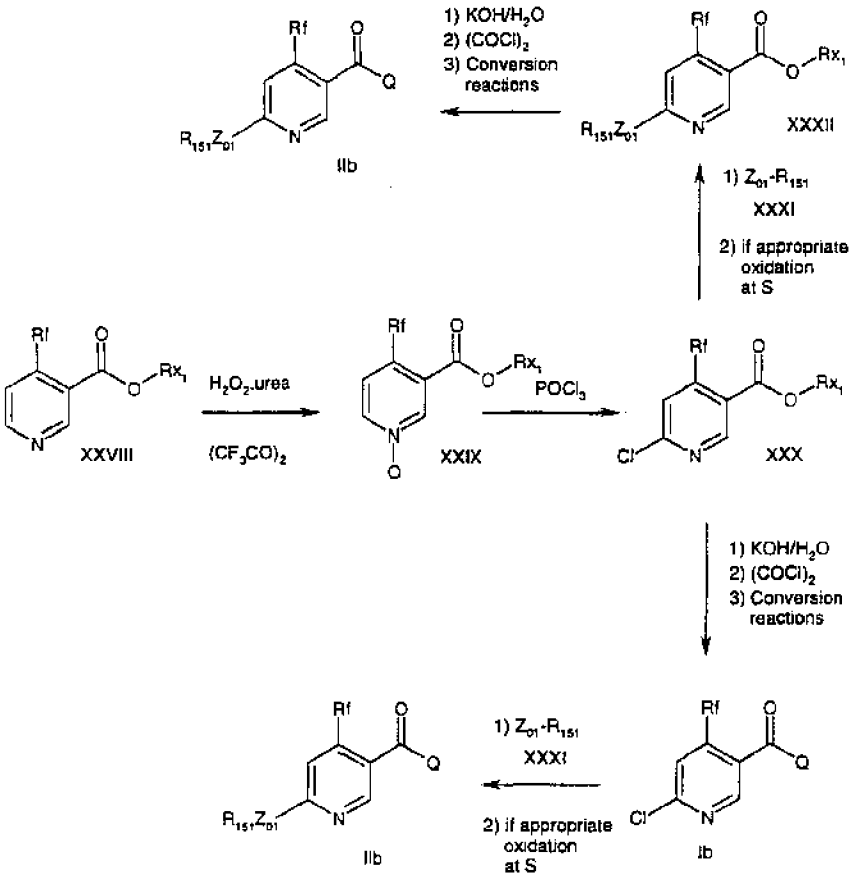
The novel compounds of the formula IIb in which R_f is trifluoromethyl, difluorochloromethyl, pentafluoroethyl, heptafluoro-n-propyl or trichloromethyl, R_{X1} is C_1-C_6alkyl and Q and R are as defined under formula I can be prepared by generally known processes via 3-alkoxycarbonyl-4-perhaloalkylpyridine N-oxides of the formula XXVIII according to

reaction scheme 5 by preparing, using suitable chlorination conditions and separation processes, the 6-chloro-4-haloalkyl-3-nicotinic esters of the formula XXX and then converting these compounds with a nucleophile of the formula XXXI

$$Z_{01}\text{-}R_{151} \quad \text{(XXXI)}$$

in which Z_{01} is SH, hydroxyl, halogen or amino and R_{151} is hydrogen, C_1-C_6alkyl, C_3-C_6-alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, halogen, C_3-C_6haloalkynyl, C_1-C_6alkylsulfonyl, C_1-C_6-haloalkyl, phenyl, benzyl, where the phenyl and benzyl groups for their part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, is C_1-C_4alkoxy-C_1-C_4alkyl or C_1-C_4alkylthio-C_1-C_4alkyl , C_1-C_4alkylsulfinyl-C_1-C_4alkyl, C_1-C_4alkylsulfonyl-C_1-C_4alkyl, or a five- to ten-membered monocyclic or fused bicyclic ring system which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, and each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms, and the ring system for its part may be mono-, di- or trisubstituted by
C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6-haloalkynyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5alkoxy-alkylthio, C_3-C_5acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4cyanoalkylthio, C_1-C_6-alkylsulfinyl, C_1-C_6haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylsulfonyl, aminosulfonyl, C_1-C_2alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3alkylene-R_{96}, $NR_{97}R_{98}$, halogen, cyano, nitro, phenyl or benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3-haloalkoxy, halogen, cyano or nitro,
R_{96} is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3-alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;
R_{97} is hydrogen or C_1-C_6alkyl and
R_{98} is C_1-C_6alkyl or C_1-C_6alkoxy;
and where substituents on nitrogen in the heterocyclic ring are different from halogen, using reaction processses which are generally known to the person skilled in the art, into the 6-substituted 4-perhaloalkylnicotinic acids of the formula XXXII and their subsequent products of the formulae IIb and Ib as described in reaction scheme 1. This is shown in reaction scheme 6 below.

Reaction scheme 6:

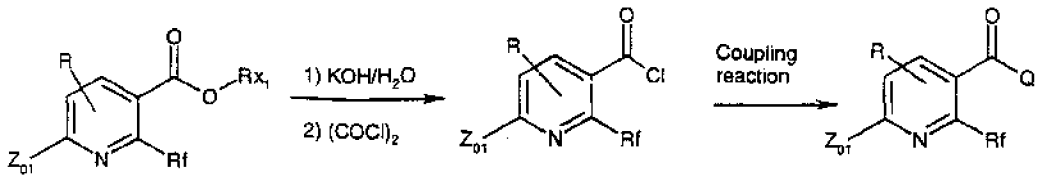


According to this reaction scheme, it is preferably possible to prepare the compounds of the formula I with the group Q_1 in which R_{20} is hydroxyl, the compounds of the formula I with the group Q_2 in which R_{23} is hydroxyl, the compounds of the formula I with the group Q_3 in which R_{26} is hydroxyl and the compounds of the formula I with the group Q_4 in which R_{30} is hydroxyl.

6-substituted 2-haloalkylnicotinic acid compounds of the formula Ic can be prepared, for example, from the corresponding 2-haloalkyl-3-alkoxycarbonyl-2-pyridines XXXIII in which R_f is trifluoromethyl, difluorochloromethyl, pentafluoroethyl, heptafluoro-n-propyl or trichloromethyl and R_{1x} is C_1-C_6alkyl and R is as defined under formula I, by hydrolysis into

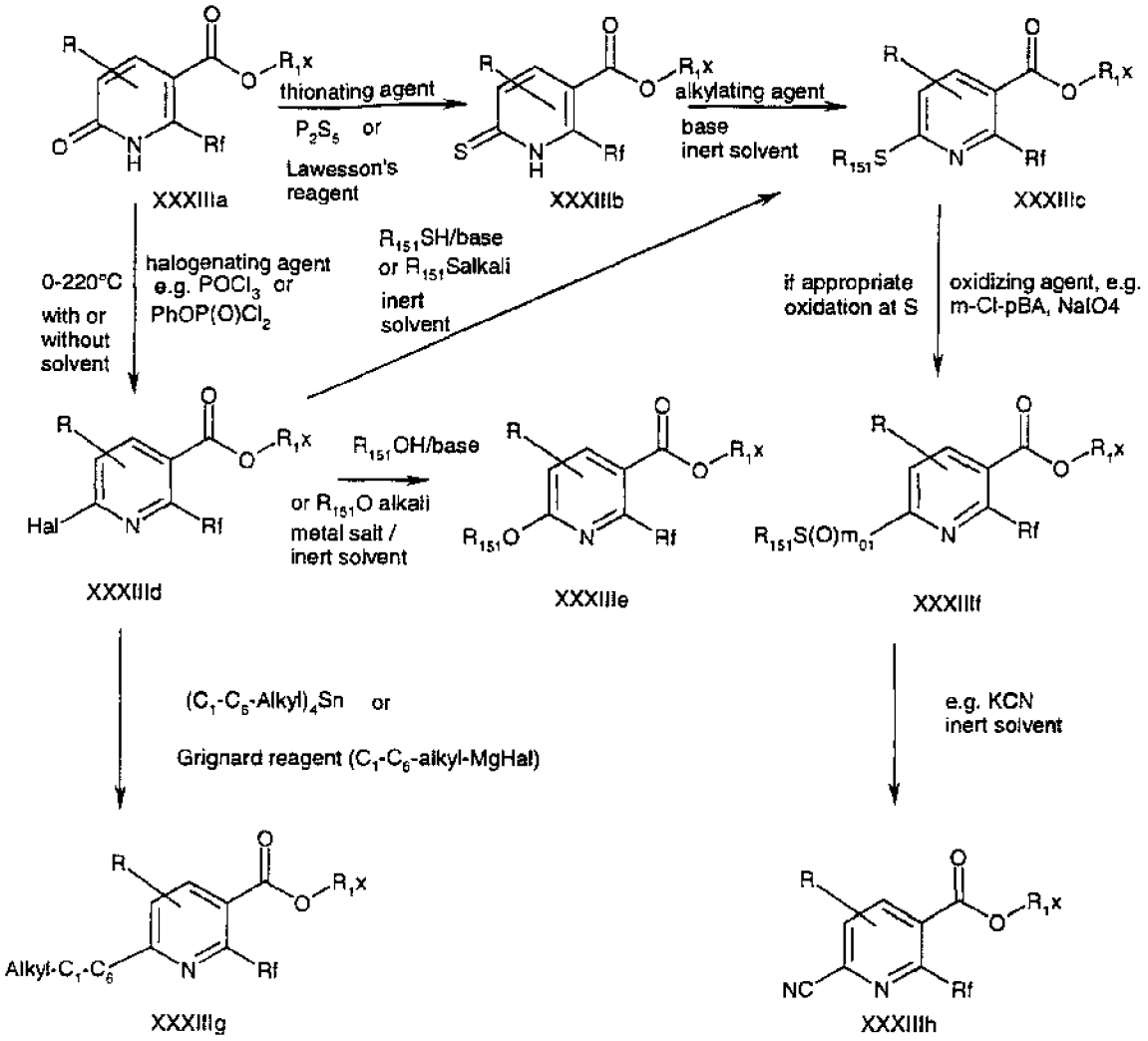
the corresponding carboxylic acids and their subsequent activation, for example by conversion into an acyl halide (IIc). (Reaction scheme 7).

Reaction scheme 7:



XXXIII IIc Ic

Their precursors of the formulae XXXIIIa, XXXIIIb, XXXIIIc, XXXIIId, XXXIIIe, XXXIIIf, XXXIIIg and XXXIIIh are likewise accessible by conversion processes known to the person skilled in the art (reaction scheme 7). 2-Trifluoromethyl-3-ethoxycarbonyl-2-pyridone (formula XXXIIIa in which R is hydrogen, R_{1X} is ethyl and Rf is trifluoromethyl) in particular is known from Org. Process Research & Development, 1, 370 (1997).



Reaction scheme 8 (intermediates of the formulae XXXIIIa-XXXIIIh)

Intermediates of the formulae XXXIIIa to XXXIIIh can be obtained by reacting, for example for preparing a 6-halo derivative of the formula XXXIIId, a pyridone of the formula XXXIIIa (preparation according to Org. Process Research & Development, 1, 370 (1997) or scheme 8) with a halogenating agent, for example phosphorus oxychloride, phosphorus oxybromide or phenyl dichlorophosphate, in the presence or absence of added base, such as a dialkylaniline, in the presence or absence of solvent, if desired in a pressure vessel, at temperatures between 0 and 220°C (preferably 60-200°C). It is known to the person skilled in the art how to convert chloro derivatives by nucleophilic substitution, for example using an alkali metal iodide in an inert solvent into the corresponding iodides, or using gaseous

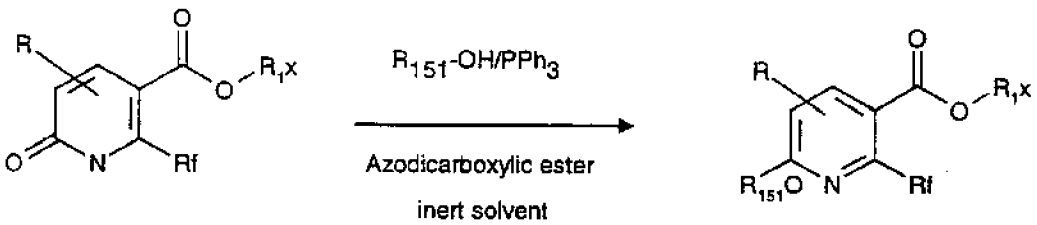
hydrobromic acid in lower carboxylic acids, for example conc. acetic acid, into the corresponding bromo derivatives (for example according to US-A-3,974,166) or using alkali metal fluoride in a dipolar solvent, such as sulfolane, into the corresponding fluoro derivatives.

The compound of the formula XXXIIIe can be prepared by reacting a halo derivative of the formula XXXIIId obtained as described above with an alcohol of the formula R_{151}-OH in the presence of a base, such as sodium hydride, or an alkali metal oxide or carbonate, or directly with an alkali metal alkoxide, in an inert solvent such as dimethylformamide or in an excess of the alcohol of the formula R_{151}-OH which corresponds to the group to be introduced, at temperatures between –5 and 160°C, or by reacting, to prepare a corresponding 6-thioether of the formula XXXIIIc, analogously to what was described above, either the halide of the formula XXXIIId with a thiol of the formula R_{151}-SH in the presence of a base such as sodium hydride or with an alkali metal salt of a thiol in an inert solvent at –10-150°C, or by preparing, starting from a pyridone XXXIIIa and using a thionating agent, for example Lawesson's reagent, in an inert solvent, such as toluene or acetonitrile, a pyrithione of the formula XXXIIIb and alkylating this with an alkylating agent R_{151}-X, where X is a leaving group, such as halide (Cl, Br, I) or $ROSO_3$- or RSO_2-, at 20-120°C in an inert solvent, such as tetrahydrofuran, to give the thioether of the formula XXXIIIc, or, to prepare the corresponding sulfinyl or sulfonyl derivative of the formula XXXIIIf, reacting with an oxidizing agent, such as m-chloroperbenzoic acid or sodium periodate, or sodium perborate, under temperature control known to the person skilled in the art, depending on the degree of oxidation (for example –30°C -+50°C for m_{01} =1 or –20°C - +100°C for m_{01}=2) in an inert solvent, such as dichloromethane, to give XXXIIIf, or, to prepare 6-alkyl derivatives XXXIIIg according to the invention, reacting a sulfone of the formula XXXIIIf (m_{01} =2) or a halo derivative of the formula XXXIIId in the presence or absence of a Pd(0) catalyst such as $Pd(PPh_3)_2Cl_2$ with a tetra-C_1-C_6alkyltin or with a Grignard reagent C_1-C_6alkyl-MgHal at temperatures between -10° and 180°C, for example analogously to Synlett 1998 (1185), or as described in Organocopper Reagents, R.J.K.Taylor, Oxford University Press 1994, or in Transition Metals in Organic Synthesis, S. Gibson, Oxford Univ. Press,1997, or in Org. React. 50, 1 (Stille reaction), or, to prepare 6-cyano derivatives of the formula XXXIIIh, reacting a halide of the formula XXXIIId or a sulfone of the formula XXXIIIf (m_{01}=2) with an alkali metal or tetraalkylammonium cyanide or

copper cyanide in an inert solvent, such as dichloromethane, tetrahydrofuran or dimethylformamide, at temperatures between 0°C and 220°C.

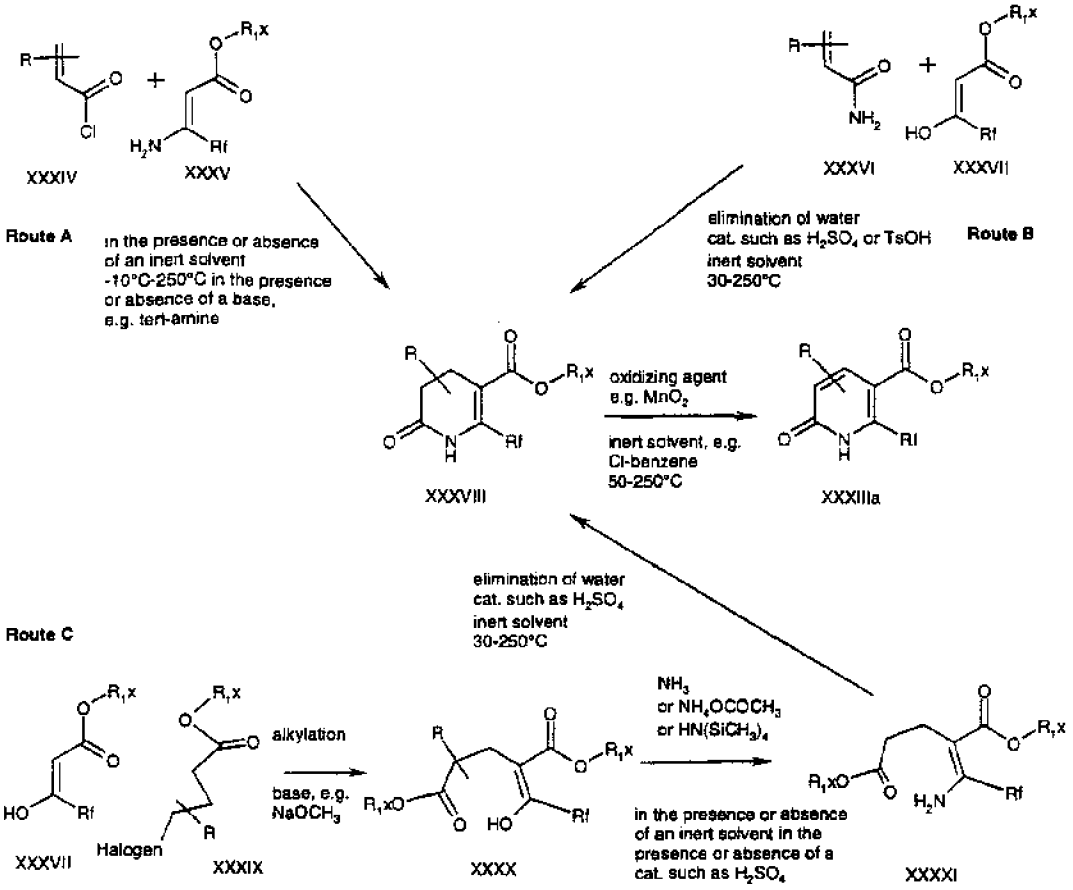
Some of the compounds of the formula XXXIIIe are also obtainable from the pyridone of the formula XXXIIIa by reacting them analogously to Org. React. 42, 2 with an alcohol $R_{151}OH$ in the presence of an azodicarboxylic ester (for example diethyl ester) and triphenylphosphine in an inert solvent, such as tetrahydrofuran or dioxane. (Scheme 9)

Reaction scheme 9:



XXXIIIa XXXIIIe

The intermediates of the formula XXXIIIa required in reaction scheme 8 as starting materials are obtainable according to Scheme 10 route A or route B (Org. Process Research & Development, 1, 370 (1997)) or route C.

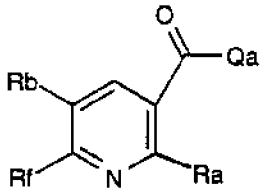


Reaction scheme 10

Intermediates of the formula XXXIIIa are obtainable by route A by reacting, to prepare the 3,4-dihydro-5-alkoxycarbonyl-6-haloalkylpyridin-2-ones of the formula XXXVIII, an enamine of the formula XXXV in the presence or, preferably, in the absence of a solvent either in an excess of enamine or in the presence of a base, such as a tert-amine, with an acryloyl chloride of the formula XXXIV at temperatures between –10° and + 200°C, or by reacting a keto ester of the formula XXXVII with an acrylamide of the formula XXXVI in the presence of a catalyst such as p-toluenesulfonic acid (=HOTs) in an inert solvent, such as toluene, at temperatures between 30 and 200°C, with removal of the water of reaction formed (for example azeotropic distillation), or by reacting a keto ester of the formula XXXVII in the presence of a base, such as an alkali metal alkoxide or magnesium alkoxide, with a 4-halo-keto ester of the formula XXXIX in an inert solvent, such as ethanol, at 0-180°C to give the intermediate of the formula XXXX, converting this with ammonia or an ammonium salt, such

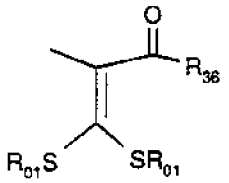
as ammonium acetate, or with a bis-silylamine such as hexamethyldisilazane, in the presence or absence of an acidic catalyst, such as sulfuric acid or p-toluenesulfonic acid or an organic carboxylic acid (for example conc. acetic acid), in an inert solvent and at temperatures between 0° and 180°C into the corresponding enamine of the formula XXXXI, subsequently cyclizing in the presence of a catalyst, such as p-toluenesulfonic acid or sulfuric acid, if desired with continuous removal of the water of reaction formed in an inert solvent, such as toluene, to give the dihydropyridone of the formula XXXVIII, and finally treating with an oxidizing agent, such as manganese dioxide, in an inert solvent, such as chlorobenzene, at temperatures between 50 and 250°C, to prepare the pyridones XXXIIIa.

The intermediates of the formula IIa



(IIa)

in which Q_a is hydroxyl, halogen, cyano, or a group $-CH_2(CO)R_{36}$ or



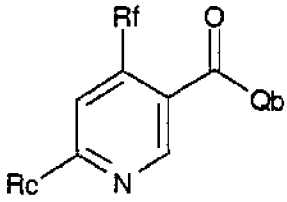
;

R_b is hydrogen, C_1-C_4alkyl or halogen;

R_f is trifluoromethyl, difluorochloromethyl, pentafluoroethyl, heptafluoro-n-propyl or trichloromethyl;

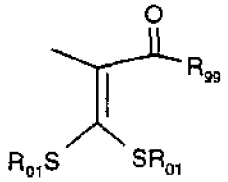
R_a is C_1-C_3alkyl, C_1-C_3haloalkyl, C_3-C_4cycloalkyl, C_1-C_2alkoxy-C_1-C_4alkyl , C_1-C_2-alkylthiomethyl, hydroxyl, halogen, cyano, C_1-C_3alkoxy, C_1-C_3haloalkoxy, allyloxy, propargyloxy, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or C_1-C_3alkylsulfonyloxy, and R_{01} and R_{36} are as defined under group Q_5 of the formula I, except for the compounds 2,6-bistrifluoromethylnicotinic acid, 2,6-bistrifluoromethyl-5-methoxynicotinic acid and 2-hydroxy-6-trifluoromethylnicotinic acid, are novel and therefore likewise form part of the subject matter of the present invention.

Compounds of the formula IIb



(IIb)

in which Q_b is hydroxyl, halogen, cyano or a group $-CH_2(CO)R_{99}$ or



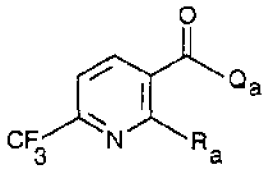
;

R_{99} is C_1-C_4alkyl, C_1-C_4haloalkyl, C_3-C_4cycloalkyl or C_1-C_4alkoxy;

R_f is trifluoromethyl, difluorochloromethyl, pentafluoroethyl or heptafluoro-n-propyl; and

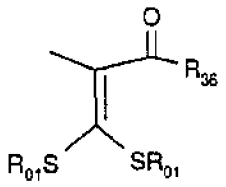
R_c is C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_2alkoxymethyl, C_1-C_2alkylthiomethyl, hydroxyl, halogen, cyano, C_1-C_3alkoxy, C_1-C_3haloalkoxy, allyloxy, propargyloxy, C_1-C_3alkylthio, C_1-C_3-alkylsulfinyl, C_1-C_3alkylsulfonyl or C_1-C_3alkylsulfonyloxy and R_{01} is as defined under formula I are novel and therefore likewise form part of the subject matter of the present invention.

Preferred compounds of the formula IIa correspond to the formula Ia



(Ia),

in which Q_a is hydroxyl, halogen, cyano or a group $-CH_2(CO)R_{36}$ or



;

R_{01} and R_{36} are as defined in claim 1 and R_a is C_1-C_3alkyl.

The compounds of the formula I or compositions comprising them can be used according to the invention in all the application methods customary in agriculture, for example pre-emergence application, postemergence application and seed dressing, and various methods and techniques, for example controlled release of active compounds. To this end, the active compound is absorbed in solution onto mineral granule carriers or polymerized granules (urea/formaldehyde) and dried. If appropriate, a coating which allows the active compound to be released in metered form over a certain period of time can additionally be applied (coated granules).

The compounds of the formula I can be employed as herbicides in unchanged form, i.e. as they are obtained in the synthesis, but they are preferably processed in a customary manner with the auxiliaries conventionally used in the art of formulation, for example to give emulsifiable concentrates, directly sprayable or dilutable solutions, dilute emulsions, wettable powders, soluble powders, dusts, granules or microcapsules. Such formulations are described, for example, in WO 97/34485 on pages 9 to 13. The methods of application, such as spraying, atomizing, dusting, wetting, scattering or watering, in the same way as the nature of the compositions, are chosen according to the aims striven for and the given circumstances.

The formulations, i.e. the compositions, formulations or preparations comprising the active compound of the formula I or at least one active compound of the formula I and as a rule one or more solid or liquid formulation auxiliaries, are prepared in a known manner, for example by intimate mixing and/or grinding of the active compounds with the formulation auxiliaries, for example solvents or solid carriers. Surface-active compounds (surfactants) can furthermore additionally be used during the preparation of the formulations. Examples of solvents and solid carriers are given, for example, in WO 97/34485 on page 6. Depending on the nature of the active compound of the formula I to be formulated, suitable surface-active compounds are nonionic, cationic and/or anionic surfactants and surfactant mixtures having good emulsifying, dispersing and wetting properties.

Examples of suitable anionic, nonionic and cationic surfactants are listed, for example, in WO 97/34485 on pages 7 and 8.

The surfactants conventionally used in the art of formulation and which are suitable to prepare the herbicidal compositions according to the invention are described, inter alia, in "Mc Cutcheon's Detergents and Emulsifiers Annual", MC Publishing Corp., Ridgewood New Jersey, 1981, Stache, H., "Tensid-Taschenbuch" [Surfactant handbook], Carl Hanser Verlag, Munich/Vienna, 1981 and M. and J. Ash, "Encyclopedia of Surfactants", Vol I-III, Chemical Publishing Co., New York, 1980-81.

The herbicidal formulations as a rule comprise 0.1 to 99% by weight, in particular 0.1 to 95% by weight, of herbicide, 1 to 99.9% by weight, in particular 5 to 99.8% by weight, of a solid or liquid formulation auxiliary and 0 to 25% by weight, in particular 0.1 to 25% by weight, of a surfactant. While concentrated compositions are rather preferred as commercial goods, the end user as a rule uses dilute compositions. The compositions can also comprise further additives, such as stabilizers, for example epoxidized or non-epoxidized vegetable oils (epoxidized coconut oil, rapeseed oil or soya oil), defoamers, for example silicone oil, preservatives, viscosity regulators, binders, tackifiers and fertilizers or other active compounds.

The active compounds of the formula I are as a rule applied to the plants or their habitat, at application rates of 0.001 to 4 kg/ha, in particular 0.005 to 2 kg/ha. The dosage required for the desired effect can be determined by tests. It depends on the nature of the effect, the development stage of the crop plant and the weed and on the application (location, time, process) and can, as a function of these parameters, vary within wide ranges.

The compounds of the formula I have herbicidal and growth-inhibiting properties, owing to which they can be used in crops of useful plants, in particular in cereals, cotton, soya, sugar beet, sugar cane, plantings, rapeseed, maize and rice, and for the non-selective control of weeds. Crops include those which have been rendered tolerant towards herbicides or herbicide classes by conventional breeding methods or genetical engineering methods. The weeds to be controlled can be both monocotyledonous and dicotyledonous weeds, for example Stellaria, Nasturtium, Agrostis, Digitaria, Avena, Setaria, Sinapis, Lolium, Solanum, Echinochloa, Scirpus, Monochoria, Sagittaria, Bromus, Alopecurus, Sorghum halepense, Rottboellia, Cyperus, Abutilon, Sida, Xanthium, Amaranthus, Chenopodium, Ipomoea, Chrysanthemum, Galium, Viola and Veronica.

The examples below illustrate the invention in more detail, without limiting it.

Preparation Examples:

Example H1: Preparation of 2-difluoromethoxy-6-trifluoromethylnicotinic acid:

At 70°C, 25 g (0.106 mol) of (3-(ethoxycarbonyl)-6-trifluoromethyl)pyrid-2-one (Helv. Chim. Acta (1988), 71(3), 596-601) in a mixture of 50 ml of dimethylformamide and 20 ml of water are treated, in the presence of 16 g (0.116 mol) of finely powdered potassium carbonate and with efficient stirring, with a continuous stream of gaseous Freon-22. After 6 hours, a further 16 g of potassium carbonate and 20 ml of dimethyl sulfoxide are added, and the mixture is stirred with continuous introduction of Freon-22 gas at a temperature of 100°C for another 4 hours. The mixture is then treated with water and ice and extracted with diethyl ether. The aqueous phase is adjusted to pH 2 using conc. HCl and extracted with ethyl acetate. Diethyl ether is added to the extract, and some (3-(carboxy)-6-trifluoromethyl)pyrid-2-one crystals which have precipitated out are removed by filtration. The filtrate is filtered through a silica gel column (mobile phase ethyl acetate/hexane 1:1) giving, as a crystalline product, pure 2-difluoromethoxy-6-trifluoromethylnicotinic acid: ^{1}H NMR ($CDCl_3$, ppm): 8.60, d, J=9 Hz, 1H; 7.62, d, J=9 Hz , 1H; 7.62, t, J=67 Hz, 1H.

Example H2: Preparation of 4-methyl-6-trifluoromethylnicotinic acid:

In the presence of 5.8 ml of phenyl dichlorophosphate, 7.5 g (0.03 mol) of ((3-ethoxycarbonyl)-4-methyl-6-trifluoromethyl)pyrid-2-one (Helv. Chim. Acta (1988), 71 (3), 596-601) are heated in a pressure vessel at a temperature of 170°C for 3 hours. The cold reaction solution is filtered directly through a short silica gel column (mobile phase: ethyl acetate/hexane 1:9), giving, as an oily product, ethyl 2-chloro-4-methyl-6-trifluoromethyl-pyridin-3-ylcarboxylate:

^{1}H NMR ($CDCl_3$, ppm): 7.49, s, 1H; 4.48, q, 2H; 2.43, s, 3H, 1.43, t, 3H.

3.0 g (16.8 mmol) of the above product and, in 2 portions, a total of 5 g of ammonium formate are added to a suspension of 0.55 g of 10% Pd/C in 20 ml of methanol, and the mixture is stirred at room temperature for 24 hours. The reaction mixture is then filtered through Celite and, after addition of sodium chloride solution, extracted with ethyl acetate. Chromatographic purification (mobile phase 1:9) gives the 4-methyl-6-trifluoromethylpyridin-3-yl ethyl ester as an oil: ^{1}H NMR ($CDCl_3$, ppm): 9.11, s, 1H; 7.56, s, 1H, 4.44, q, 2H; 2.72,

s, 3H, 1.42, t, 3H. This is hydrolysed at 40°C in the presence of aqueous potassium hydroxide solution in dioxane. Extraction with ethyl acetate gives, after acidification to pH 2.7, 4-methyl-6-trifluoromethylnicotinic acid as a crystalline product: ^{1}H NMR ($CDCl_3$, ppm): 7.49, s, 1H; 4.48, q, 2H; 2.43, s, 3H, 1.43, t, 3H; 9.32, s, 1H, 7.62, s, 1H, 2.79, s, 3H.

Example H3: Preparation of 6-chloro-4-trifluoromethylnicotinic acid:

9.6 g (0.047 mol) of methyl 4-trifluoromethylpyridin-3-ylcarboxylate, dissolved in 50 ml of dichloromethane, are treated with 30% hydrogen peroxide/urea adduct and 17 ml of trifluoroacetic anhydride. The reaction solution is stirred at temperature of 20°C for 20 hours and then washed once each with dilute sodium hydroxide solution and half-saturated sodium chloride solution. The product obtained is 3-methoxycarbonyl-4-trifluoromethyl-3-pyridine N-oxide; ^{1}H NMR ($CDCl_3$, ppm): 8.55, s, 1H; 8.31, d, 1H; 7.6, d, 1H; 3.98, s, 3H. 4.85 g (0.022 mol) of the above product are then added to a mixture of 5 ml of phosphorus oxychloride and 4.3 ml of ethyldiisopropylamine in 15 ml of 1,2-dichloroethane, and the mixture is heated to a temperature of 60°C. After about 2 hours, another 2 ml of phosphorus oxychloride and 2.8 ml of ethyldiisopropylamine are added, and the mixture is stirred at this temperature for 20 hours. The reaction mixture is subsequently added to ice-water, adjusted to pH 3 using 30% NaOH and then extracted with dichloromethane. Filtration through a little silica gel gives an approximately 5:1 product mixture of the two 6-chloro- and 2-chloro-4-trifluoromethylpyridin-3-yl methyl esters, which can be separated by HPLC into the pure components. Thus, pure methyl 6-chloro-4-trifluoromethylpyridin-3-ylcarboxylate is obtained as the main product; ^{1}H NMR ($CDCl_3$, ppm): 8.91, s, 1H; 7.68, s, 1H; 3.98, s, 3H, and pure methyl 2-chloro-4-trifluoromethylpyridin-3-ylcarboxylate is obtained as the byproduct; ^{1}H NMR ($CDCl_3$, ppm): 8.64, d, 1H; 7.52, d, 1H; 4.01, s, 3H. In the presence of 0.073 g of potassium hydroxide, 0.22 g of pure methyl 6-chloro-4-trifluoromethylpyridin-3-ylcarboxylate are hydrolysed at room temperature in a 1:1 mixture of 6 ml of dioxane/water. Recrystallization gives the pure 6-chloro-4-trifluoromethylnicotinic acid: m.p. 115-117°C; ^{1}H NMR ($CDCl_3$, ppm): 9.12, s, 1H; 7.24, s, 1H.

Example H4: Preparation of 6-methylthio-4-trifluoromethylnicotinic acid:

In boiling acetone, 0.70 g (2.9 mol) of methyl 6-chloro-4-trifluoromethylpyridin-3-ylcarboxylate is treated in the presence of a catalytic amount of 18-crown-6 with

methanethiolate (0.33 g) until no further conversion can be detected by gas chromatographic analysis. The mixture is then filtered through silica gel and evaporated. This gives 0.73 g of methyl 6-methylthio-4-trifluoromethylpyridin-3-ylcarboxylate; ^{1}H NMR ($CDCl_3$, ppm): 8.98, s, 1H; 7.48, s, 1H; 3.94, s, 3H; 2.64, s, 3H.
Hydrolysis under the conditions mentioned above gives 6-methylthio-4-trifluoromethyl-nicotinic acid: ^{1}H NMR ($CDCl_3$, ppm): 9.02, s, 1H; 7.46, s, 1H; 2.64, s, 3H.

Example H5: 6-Hydroxy-2-trifluoromethylpyridin-3-yl ethyl ester:

Under an atmosphere of nitrogen and with stirring, 33.4 g of 3,4-dihydro-5-ethoxycarbonyl-6-trifluoromethylpyridin-2-one (Org. Res.& Devel. 1,370 (1997)) and 34 g of manganese dioxide in 250 ml of 1,2-dichlorobenzene are heated under reflux for 24 hours. In intervals of about 20 hours, manganese dioxide (total amount of MnO_2 used: 213 g) is added six more times over a period of 3 days, and the mixture is in each case heated further under reflux. The mixture is then cooled, diluted with ethyl acetate, and filtered through silica gel, the filtercake is washed with ethyl ester and the filtrate is concentrated. The solid residue (26.7 g, i.e. 80%), which may still contain about 6% of starting material, is directly reacted further. For complete purification, it is possible to purify, for example, over silica gel (hexane/ethyl acetate 7:3) (^{1}H NMR, $CDCl_3$, ppm): 8.02 (d, 1H); 6.85 (d, 1H); 4.86 (q, 2H); 1.37 (t, 1H).

Example H6: Preparation of ethyl 6-chloro-2-trifluoromethylpyridin-3-ylcarboxylate:

In a bomb tube, 23.5 g of ethyl 6-hydroxy-2-trifluoromethylpyridin-3-ylcarboxylate and 23.5 ml of phenyl dichlorophosphate are heated at 170°C for 3 hours, and the mixture is, after cooling, added to ice-water, stirred for a few minutes and subsequently taken up in ethyl acetate and made slightly alkaline using sodium bicarbonate and then washed neutral with water. The extracts are admixed with a little hexane and filtered through silica gel. The filtrate is evaporated, leaving 21.6 g (85%) of the title compound in the form of a dark oil with n_D^{30} 1.4679. ^{1}H NMR ($CDCl_3$, ppm): 8.09 (d,1H); 7.60 (d,1H); 4.43 (q, 2H); 1.43 (t,3H).

Example H7: Preparation of 6-chloro-2-trifluoromethylpyridin-3-ylcarboxylic acid:

2.5 g of the ethyl 6-chloro-2-trifluoromethylpyridin-3-ylcarboxylate obtained above are dissolved in the smallest possible amount of tetrahydrofuran, treated with approximately 20 g of ice and 11 ml of 1N lithium hydroxide and stirred at room temperature until hydrolysed completely. The mixture is then washed with a little ether and the aqueous phase is acidified using 4N hydrochloric acid and extracted with ethyl acetate. The extracts are washed with sodium chloride solution, dried and evaporated. This gives 1.8 g of the title compound of m.p. 154-156°C. The other free carboxylic acids are likewise obtained from their esters in this manner.

Example H8: Preparation of ethyl 6-methylthio-2-trifluoromethylpyridin-3-ylcarboxylate:

Under an atmosphere of nitrogen and with stirring, a solution of 1.7 g of 6-chloro-2-trifluoromethylpyridin-3-yl ethyl ester in 60 ml of dimethylformamide is treated a little at a time with 0.52 g of sodium methanethiolate and stirred at room temperature until the reaction has gone to completion. The reaction mixture is then poured into ice-water, made neutral by addition of a little dilute hydrochloric acid and extracted with ethyl acetate. The extracts are diluted with a little hexane, washed with water, dried over sodium sulfate, filtered and, after filtration through a little silica gel, evaporated. This gives 1.4 g (79%) of the title compound in the form of an oil with n_D^{25} 1.5100, ^{1}H NMR ($CDCl_3$, ppm): 7.90 (d, 1H); 7.40 (d, 1H); 1.40 (q, 2H); 2.60 (s, 3H); 1.49 (t, 3H).

Example H9: Preparation of ethyl 6-ethylthio-2-trifluoromethylpyridin-3-ylcarboxylate:

In an apparatus previously flushed with nitrogen, a solution of 1.8 ml of ethanethiol in 40 ml of dimethylformamide, which had been cooled to 0°C, is treated a little at a time with 0.96 g of sodium hydride oil dispersion (60%), and the mixture is stirred at room temperature. After evolution of hydrogen has ceased, the mixture is cooled to -20°C, and a solution of 5.07 g of 6-chloro-2-trifluoromethylpyridin-3-yl ethyl ester in 10 ml of dimethylformamide is added dropwise at this temperature, and the mixture is stirred slowly until room temperature has been reached. After the reaction has ended (approximately 3 hours), the reaction mixture is added to ice-water and extracted with ethyl acetate. The extracts are washed with water, dried, filtered, evaporated and dried under high vacuum. This gives 5.0 g (89%) of the title

compound as a brownish oil. ^{1}H NMR ($CDCl_3$, ppm): 7.90 (d, 1H); 7.35 (d, 1H); 4.40 (q, 2H); 3.25 (q, 2H); 1.38 (2t, 6H).

Example H10: Preparation of ethyl 6-ethylsulfinyl-2-trifluoromethylpyridin-3-ylcarboxylate:

Under an atmosphere of nitrogen and with stirring and cooling, a solution of 2.5 g of m-chloroperbenzoic acid in 40 ml of methylene chloride is added dropwise at a temperature of –20°C to a solution of 2.8 g of ethyl 6-ethylthio-2-trifluoromethylpyridin-3-ylcarboxylate, which had been charged initially, and the mixture is stirred at a temperature of +5°C for 20 hours. The mixture is then evaporated gently and purified over silica gel (hexane/ethyl acetate 7:3). This gives 2.48 g (84%) of 6-ethylsulfinyl-2-trifluoromethylpyridin-3-yl-ethyl ester. ^{1}H NMR ($CDCl_3$, ppm): 8.38 (d, 1H); 8.30 (d, 1H); 4.45 (q, 2H); 3.26 – 3.00 (m, 2H); 1.43 (t, 3H); 1.26 (t, 3H).

Ethyl 6-methylsulfinyl-2-trifluoromethylpyridin-3-ylcarboxylate is obtained in an analogous manner.

Example H11: Preparation of ethyl 6-methylsulfonyl-2-trifluoromethylpyridin-3-ylcarboxylate:

Under an atmosphere of nitrogen and with stirring and cooling, 21 g of m-chloroperbenzoic acid are introduced a little at a time over a period of 30 minutes at a temperature of –20°C into a solution of 3.6 g of 6-methylthio-2-trifluoromethylpyridin-3-yl ethyl ester, which had been charged initially, and the reaction mixture is stirred at room temperature for 5 hours. The mixture is then evaporated and filtered through silica gel (ethyl acetate/methanol/ triethylamine 85:10:5). This gives 3.95 g (97%) of ethyl 6-methylsulfonyl-2-trifluoromethylpyridin-3-ylcarboxylate as a brownish solid with m.p. 70-72°C. ^{1}H NMR ($CDCl_3$, ppm): 8.40 (1H,d); 8.33 (1H,d); 4.47 (2H,q); 1.43 (3H,t).

Example H12: Preparation of ethyl 6-cyano-2-trifluoromethylpyridin-3-ylcarboxylate:

Under an atmosphere of nitrogen and with stirring, a solution of 0.596 g of ethyl 6-methylsulfonyl-2-trifluoromethylpyridin-3-ylcarboxylate in 5 ml of dimethylformamide is treated with 160 mg of solid potassium cyanide and a spatula tipful of 18-crown-6, and the mixture is heated at 80°C for 3 hours. The mixture is cooled overnight, and the next day

another 30 mg of potassium cyanide are added and the mixture is heated further until the starting material has disappeared (approximately 2 hours). The mixture is then cooled, added to ice-water and extracted with ethyl acetate. The extracts are washed with water, dried, evaporated and freed from traces of dimethylformamide under high vacuum at approximately 40°C. This gives 480 mg (yield virtually quantitative) of ethyl 6-cyano-2-trifluoromethylpyridin-3-ylcarboxylate in the form of an oil which slowly solidifies. ^{1}H NMR ($CDCl_3$, ppm): 8.29 (1H,d); 7.97 (1H,d); 4.48 (2H, d); 1.43 (3H,t).

Example H13: Preparation of ethyl 6-methyl-2-trifluoromethylpyridin-3-ylcarboxylate:

Under an atmosphere of nitrogen and with stirring, a solution of 3.6 g of 6-chloro-2-trifluoromethylpyridin-3-yl ethyl ester in 20 ml of dimethylacetamide is treated with 4.5 ml of tetramethyltin and 200 mg of dichloro(bistriphenylphosphine)palladium, and the mixture is heated to a temperature of 80-90°C for 24 hours. Then another 1.5 ml of tetramethyltin and 30 mg of dichloro(bistriphenylphosphine)palladium are added and the mixture is heated for another 6 hours. The reaction mixture is then freed from excess tetramethyltin using reduced pressure (destruction by passing through ethanolic sodium hydroxide solution), cooled and added to ice-water. The mixture is extracted with diethyl ether and the extract is washed with water, dried over sodium sulfate, filtered through a little silica gel, evaporated and dried under reduced pressure. This gives the title compound (2.4 g, 73%), which still contains traces of dimethylacetamide, in the form of a dark oil.
^{1}H NMR ($CDCl_3$, ppm): 8.00 (1H,d); 7.42 (1H,d); 4.42 (2H, d); 2.68 (3H, s); 1.41 (3H,t).
Hydrolysis analogously to the description already mentioned above affords 6-methyl-2-trifluoromethylpyridin-3-ylcarboxylic acid (brown resin) which is directly converted further into the carbonyl chloride.

Example H14: Preparation of 6-methyl-2-trifluoromethylpyridin-3-ylcarbonyl chloride:

A solution of 0.45 g of 6-methyl-2-trifluoromethylpyridin-3-ylcarboxylic acid in 20 ml of dichloromethane is charged initially, 3 drops of dimethylformamide are added and the mixture is subsequently treated with 1.6 ml of oxalyl chloride. After the intensive evolution of gas has ceased, the mixture is kept at a bath temperature of 40°C for another 1.5 hours and then evaporated. The crude product (0.56 g) that remains as residue can be directly reacted further. ^{1}H NMR ($CDCl_3$, ppm): 8.20 (1H,d); 7.51 (1H,d); 2.65 (3H, s).

Example H15: Preparation of 4-oxobicyclo[3.2.1]oct-2-en-2-yl 6-methyl-2-trifluoromethyl-nicotinate:

Under an atmosphere of nitrogen and with stirring and cooling, a solution of 0.56 g of 6-methyl-2-trifluoromethylpyridin-3-ylcarbonyl chloride in 10 ml of methylene chloride is added dropwise at 0°C to a solution of 0.4 g of bicyclo[3.2.1]octane-2,4-dione and 0.72 g of triethylamine in 10 ml of methylene chloride, and the mixture is stirred for 5 hours until room temperature has been reached. The mixture is then diluted with methylene chloride, washed with cold 1N hydrochloric acid, dried and evaporated to give the desired enol ester (0.8 g) as a brown resin which is directly reacted further. ^{1}H NMR ($CDCl_3$, ppm): 8.17 (1H,d); 7.51 (1H, d); 5.96 (1H, s); 3.04 (2H, m); 2.75 (3H, s); 2.32-1.30 (m).

Example H16: Preparation of 4-hydroxy-3-(6-methyl-2-trifluoromethylpyridin-3-carbonyl)-bicyclo[3.2.1]oct-3-en-2-one:

Under an atmosphere of nitrogen and with stirring, 0.8 g of the above enol ester is dissolved in 30 ml of acetonitrile at 25 °C, and the mixture is treated with 0.5 ml of triethylamine and 0.4 ml of acetone cyanohydrin and stirred at room temperature for 20 hours. The mixture is then diluted with solvent and washed with dilute hydrochloric acid, dried and evaporated, and the residue is purified through a little silica gel (ethyl acetate/methanol/triethylamine 85:10:5). This gives 371 mg (46%) of the title compound (triethylamine salt) in the form of a yellowish resin. ^{1}H NMR ($CDCl_3$, ppm): 7.45 (1H, d); 7.25 (1H, d); 3.80-3.43 (4H, m); 3.18 (6H, m); 2.80 (2H, s(br)); 2.62 (3H, s); 2.20-1.54 (m).

Example H17: Preparation of ethyl 6-methoxy-2-trifluoromethylpyridin-3-ylcarboxylate:

A suspension of 5.65 g of ethyl 6-hydroxy-2-trifluoromethylpyridin-3-ylcarboxylate, 6.0 g of potassium carbonate and 2.7 ml of methyl iodide is, together with a spatula tipful of 18-crown-6, heated to a temperature of 60-70°C until the reaction has gone to completion. The mixture is then filtered, the filtration residue is washed with acetonitrile and the filtrate is concentrated under reduced pressure. The residue is cooled, admixed with ice-water, neutralized with dilute sulfuric acid and extracted with ethyl acetate. The extracts are washed with water, dried, diluted with a little hexane and filtered through a little silica gel.

The resulting residue is the title compound (3.7 g, 65%) in the form of slightly orange crystals of m.p. 150-152°C.
^{1}H NMR ($CDCl_3$, ppm): 8.00 (1H, d); 6.83 (1H, d); 4.38 (2H, q); 4.01 (3H, s);1.39 (3H, t).

Example H18: Preparation of 4-hydroxy-3-(2-methyl-6-trifluoromethylpyridin-3-carbonyl)-bicyclo[3.2.1]oct-3-en-2-one:

6.68 g (0.0305 mol) of methyl 2-methyl-6-trifluoromethylnicotinate (prepared as described in Heterocycles, 46, 129 (1997)) are dissolved in 250 ml of methanol/water (3:1 mixture), and 1.92 g (0.046 mol) of lithium hydroxide hydrate are added a little at a time at 22°C. After 4 hours at 22°C, the reaction mixture is poured into ethyl acetate and 2 N hydrochloric acid, the organic phase is washed three times with water, dried with sodium sulfate and evaporated and the residue is triturated with a little hexane. Filtration gives 5.69 g (90% of theory) of the expected 2-methyl-6-trifluoromethylnicotinic acid of m.p. 147-149°C.
The 2-methyl-6-trifluoromethylnicotinic acid obtained (2.0 g, 0.0098 mol) is dissolved in 20 ml of oxalyl chloride. Three drops of dimethylformamide are added, and the mixture is heated under reflux for 1 hour. The mixture is then concentrated using a rotary evaporator, and the residue (2-methyl-6-trifluoromethylnicotinoyl chloride) is taken up in 30 ml of methylene chloride. At 0°C, 2.7 ml (0.0196 mol) of triethylamine and 0.12 g (0.00098 mol) of dimethylaminopyridine are added. 1.49 g (0.0108 mol) of bicyclo[3.2.1]octane-2,4-dione, dissolved in 20 ml of methylene chloride, are then added dropwise. After 3 hours at 22°C, the reaction mixture is extracted with 2 N hydrochloric acid. The methylene chloride phase is separated off, washed with water and subsequently extracted with 10% aqueous sodium bicarbonate solution, dried over sodium sulfate and evaporated. This gives 3.18 g (100% of theory) of 4-oxobicyclo[3.2.1]oct-2-en-2-yl 2-methyl-6-trifluoromethylnicotinate as an oil, which can be processed further without purification.
3.02 g (0.0093 mol) of 4-oxobicyclo[3.2.1]oct-2-en-2-yl 2-methyl-6-trifluoromethylnicotinate and 1.9 ml (0.0136 mol) of triethylamine are dissolved in 45 ml of acetonitrile. At 22°C, 0.01 ml of acetone cyanohydrin are added. After 18 hours at 22°C, the reaction mixture is poured into dilute hydrochloric acid and extracted with ethyl acetate. The ethyl acetate phase is washed with water and then with brine, dried over sodium sulfate and evaporated, and the residue is dissolved in a little warm acetone. The product crystallizes on standing. Filtration gives 0.99 g (33% of theory) of the expected 4-hydroxy-3-(2-methyl-6-

trifluoromethylpyridine-3-carbonyl)bicyclo[3.2.1]oct-3-en-2-one as white crystals (m.p. 75-77°C).

Example H19: Preparation of 3-(2-methyl-6-trifluoromethylpyridine-3-carbonyl)-4-oxo-bicyclo[3.2.1]oct-2-en-2-yl benzoate:

At 0°C, a solution of 0.562 g (0.0004 mol) of benzoyl chloride in 1 ml of tetrahydrofuran is added to a solution of 1.14 g (0.0035 mol) of 4-hydroxy-3-(2-methyl-6-trifluoromethylpyridine-3-carbonyl)bicyclo[3.2.1]oct-3-en-2-one and 0.517 g (0.004 mol) of ethyldiisopropylamine in 15 ml of tetrahydrofuran. The reaction mixture is stirred at 25°C for 2 hours, evaporated and purified over silica gel (hexane/ethyl acetate 1:1). This gives 0.9 g (60%) of the title compound in the form of a yellowish resin. ^{1}H NMR ($CDCl_3$, ppm): 7.91-7.87, m, 3H; 7.64, t, J=7.5 Hz, 1H; 7.50-7.40, m, 3H; 3.24, br t, J=4 Hz, 1H; 3.14, br t, J=4 Hz, 1H; 2.70, s, 3H; 2.47, d, J=13.5 Hz, 1H; 2.40, 2.15, m, 3H; 1.95-1.8, m, 2H.

Example H20: Preparation of 4-hydroxy-3-(2-methyl-1-oxy-6-trifluoromethylpyridine-3-carbonyl)bicyclo[3.2.1]oct-3-en-2-one:

16.25 g (0.05 mol) of 4-hydroxy-3-(2-methyl-6-trifluoromethylpyridine-3-carbonyl)-bicyclo[3.2.1]oct-3-en-2-one and 9.4 g (0.1 mol) of urea/hydrogen peroxide complex are dissolved in 150 ml of methylene chloride, and 20.5 ml (0.15 mol) of trifluoroacetic anhydride are added dropwise at 25°C. After 14 hours at 25°C, the reaction mixture is added to ethyl acetate and water, and the organic phase is washed twice with water, dried with sodium sulfate and evaporated. The residue is chromatographed over silica gel (mobile phase: ethyl acetate/methanol 9/1). This gives 6.8 g (40%) of the desired product as white crystals (m.p. 109-110°C).

Example H21: Preparation of 4-chloro-3-(2-methyl-6-trifluoromethylpyridine-3-carbonyl)-bicyclo[3.2.1]oct-3-en-2-one:

20.15 g (0.062 mol) of 4-hydroxy-3-(2-methyl-6-trifluoromethylpyridine-3-carbonyl)-bicyclo[3.2.1]oct-3-en-2-one are suspended in 50 ml of oxalyl chloride, and 0.1 ml of dimethylformamide are added dropwise. After the intensive evolution of gas has ceased, the mixture is kept at a bath temperature of 45°C for another 1.5 hours and then

evaporated, and the residue is suspended in a little ethyl acetate and admixed with stirring at 0°C with hexane. Filtration gives 19.19 g (90% of theory) of 4-chloro-3-(2-methyl-6-trifluoromethyl-pyridine-3-carbonyl)bicyclo[3.2.1]oct-3-en-2-one of m.p. 137-138°C.

Example H22: Preparation of 4-amino-3-(2-methyl-6-trifluoromethylpyridine-3-carbonyl)-bicyclo[3.2.1]oct-3-en-2-one:

1.0 g (0.0029 mol) of 4-chloro-3-(2-methyl-6-trifluoromethylpyridine-3-carbonyl)-bicyclo[3.2.1]oct-3-en-2-one are dissolved in 10 ml of tetrahydrofuran and, at 25°C, treated with 2.0 ml of aqueous ammonia (30%). After 0.5 hours at 25°C, the reaction mixture is added to ethyl acetate and water, the organic phase is washed twice with water, dried with sodium sulfate and evaporated and the residue is triturated with a little ethyl acetate. Filtration gives 0.81 g (86% of theory) of 4-amino-3-(2-methyl-6-trifluoromethylpyridine-3-carbonyl)bicyclo[3.2.1]oct-3-en-2-one in the form of white crystals (m.p. 262-263°C). ^{1}H NMR ($CDCl_3$, ppm): 10.62 br s 1H; 8.223 br s 1H; 7.41, d, J= 8.1 Hz, 1H; 7.35, d, J= 8.1 Hz, 1H; 3.03, br t, J= 4.8 Hz, 1H; 2.70, br t, J= 4.8 Hz, 1H; 2.41, s, 3H; 1.97-2.14, m, 3H; 1.77-1.812, m, 1H; 1.47-1.70, m, 2H.

Example H23: Preparation of 4-(4-chlorophenylsulfanyl)-3-(2-methyl-6-trifluoromethyl-pyridine-3-carbonyl)bicyclo[3.2.1]oct-3-en-2-one:

2.0 g (0.0058 mol) of 4-chloro-3-(2-methyl-6-trifluoromethylpyridine-3-carbonyl)-bicyclo[3.2.1]oct-3-en-2-one, 0.07 g of dimethylaminopyridine (0.00058 mol) and 1.61 ml of triethylamine are dissolved in 15 ml of methylene chloride. At 25°C, 0.092 g (0.0064 mol) of 4-chlorothiophenol are added. After 2 hours at 22°C, the reaction mixture is evaporated and purified over silica gel (hexane/ethyl acetate 2:1). Recrystallization (hexane/acetic acid at -25°C) gives pure 4-(4-chlorophenylsulfanyl)-3-(2-methyl-6-trifluoromethylpyridine-3-carbonyl)bicyclo[3.2.1]oct-3-en-2-one: m.p. 130-131°C.

Example H24: Preparation of 4-(4-chlorobenzenesulfonyl)-3-(2-methyl-6-trifluoromethyl-pyridine-3-carbonyl)bicyclo[3.2.1]oct-3-en-2-one:

0.6 g (0.00133 mol) of the 4-(4-chlorophenylsulfanyl)-3-(2-methyl-6-trifluoromethylpyridine-3-carbonyl)bicyclo[3.2.1]oct-3-en-2-one obtained above is dissolved in methylene chloride,

and 0.9 ml of peracetic acid (39% in acetic acid, 0.0053 mol) are added dropwise at 25°C. After 5 hours at 25°C, the reaction mixture is added to ethyl acetate and water, the organic phase is washed with water, dried with sodium sulfate and evaporated and the residue is triturated with a little hexane. Filtration gives 0.56 g (84% of theory) of 4-(4-chlorobenzenesulfonyl)-3-(2-methyl-6-trifluoromethylpyridine-3-carbonyl)bicyclo[3.2.1]oct-3-en-2-one in the form of white crystals (m.p.166-167°C).

Example H25: Preparation of (5-cyclopropyl-3-methylsulfanylisoxazol-4-yl)-(2-methyl-6-trifluoromethylpyridin-3-yl)methanone and cyclopropyl-[3-methylsulfanyl-5-(2-methyl-6-trifluoromethylpyridin-3-yl)isoxazol-4-yl]methanone:

14.8 g (0.080 mol) of tert-butyl 3-cyclopropyl-3-oxopropionic acid ester are dissolved in 25 ml of MeOH, and 1.93 g (0.080 mol) of magnesium are added. With ice-bath cooling, 7 ml of carbon tetrachloride are added dropwise, and the reaction mixture is stirred at a temperature of 22°C for one hour. After evaporation, the residue is suspended in 100 ml of acetonitrile, and 16.31 g (0.073 mol) of 2-methyl-6-trifluoromethylnicotinoyl chloride (prepared as described in Example H18), dissolved in 50 ml of acetonitrile, are added dropwise at a temperature of 22°C. After 6 hours, the reaction mixture is taken up in ethyl acetate and washed with saturated sodium bicarbonate solution. The ethyl acetate phase is separated off, washed with water, dried over sodium sulfate and evaporated. The residue is dissolved in 160 ml of methylene chloride, and 10 ml of trifluoroacetic acid are added dropwise at a temperature of 22°C. After 18 hours, the reaction mixture is poured into water and extracted with methylene chloride. The methylene chloride phase is washed with water and then with saturated aqueous sodium chloride solution, dried over sodium sulfate and evaporated. This gives 17.3 g (88% of theory) of 1-cyclopropyl-3-(2-methyl-6-trifluoromethylpyridin-3-yl)propane-1,3-dione as an oil, which is processed further without purification. The 1-cyclopropyl-3-(2-methyl-6-trifluoromethylpyridin-3-yl)propane-1,3-dione obtained above (15.0 g, 0.055 mol) is dissolved in 150 ml of dimethylformamide, and 50 g of potassium fluoride on an aluminium oxide support (alumina) (0.0055 mol/g, 0.276 mol) are added a little at a time at a temperature of 0°C. After 5 minutes, 6.7 g (0.088 mol) of carbon disulfide are added dropwise. After 2 hours, 23.6 g (0.166 mol) of methyl iodide are added dropwise, and the reaction mixture is warmed to a temperature of 22°C. After a further 2 hours, the alumina is filtered off, the filtrate is added to water and the mixture is extracted with ethyl acetate. The ethyl acetate phase is washed with water and then with

saturated aqueous sodium chloride solution, dried over sodium sulfate and evaporated. The residue is chromatographed over silica gel (mobile phase: ethyl acetate/hexane 15/1). This gives 12.0 g (60% of theory) of 2-(bismethylsulfanylmethylene)-1-cyclopropyl-3-(2-methyl-6-trifluoromethylpyridin-3-yl)-propane-1,3-dione as a solid.
12.0 g (0.033 mol) of the product obtained above are, together with 5.4 g (0.066 mol) of anhydrous sodium acetate, suspended in 120 ml of ethanol. 4.6 g (0.066 mol) of hydroxylamine hydrochloride are added, and the reaction mixture is kept at a temperature of 22°C for 5 hours. Another 2.7 g of anhydrous sodium acetate and 2.3 g of hydroxylamine hydrochloride are then added. After 18 hours, the reaction mixture is diluted with water and extracted with ethyl acetate. The ethyl acetate phase is washed with water and then with saturated aqueous sodium chloride solution, dried over sodium sulfate and evaporated. Trituration with a little ethyl acetate gives 9.0 g (79.5%) of the desired product as a 2:1 isomer mixture in the form of white crystals (m.p. 103-104°C).

Main isomer: ^{1}H NMR ($CDCl_3$, ppm) ((5-cyclopropyl-3-methylsulfanylisoxazol-4-yl)-(2-methyl-6-trifluoromethylpyridin-3-yl)methanone) 7.98, d, J=7.8 Hz, 1H; 7.61, d, J=7.8 Hz, 1H; 2.67, s, 3H; 2.50, s, 3H; 2.02-1.93, m, 1H; 1.34-1.28, m, 2H; 1.18-1.09, m, 2H.

^{1}H NMR ($CDCl_3$, ppm) (cyclopropyl-[3-methylsulfanyl-5-(2-methyl-6-trifluoromethylpyridin-3-yl)isoxazol-4-yl]methane): 7.95, d, J=7.8 Hz, 1H; 7.69, d, J=7.8 Hz, 1H; 2.67, s, 3H; 2.66, s, 3H; 1.74-1.64, m, 1H; 1.28-1.18, m, 2H; 0.89-0.80, m, 2H.

Example H26: Preparation of (5-cyclopropyl-3-methylsulfinylisoxazol-4-yl)-(2-methyl-6-trifluoromethylpyridin-3-yl)methanone and cyclopropyl-[3-methanesulfinyl-5-(2-methyl-6-trifluoromethylpyridin-3-yl)isoxazol-4-yl]methanone:

1.50 g (0.0043 mol) of the isomer mixture obtained above are dissolved in 30 ml of acetone/water (2:1 mixture), and 1.02 g (0.0048 mol) of sodium metaperiodate are added a little at a time at 22°C. After 5 hours, the reaction mixture is evaporated using a rotary evaporator. The residue is taken up in water and ethyl acetate. The ethyl acetate phase is dried over sodium sulfate and evaporated. The residue is chromatographed over silica gel (mobile phase: ethyl acetate/hexane 3/1). This gives initially 0.8 g (51% of theory) of (5-cyclopropyl-3-methylsulfinylisoxazol-4-yl)-(2-methyl-6-trifluoromethylpyridin-3-yl)methanone as white crystals (m.p. 96-97°C). ^{1}H NMR ($CDCl_3$, ppm): 7.86, d, J=7.8 Hz, 1H; 7.59, d,

J=7.8 Hz, 1H; 3.078, s, 3H; 2.66, s, 3H; 1.54-1.49, m, 1H; 1.32-1.25, m, 2H; 1.13-1.072, m, 2H.

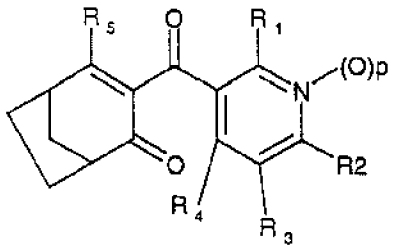
The second product that elutes consists of 0.34 g (22% of theory) of cyclopropyl-[3-methanesulfinyl-5-(2-methyl-6-trifluoromethylpyridin-3-yl)isoxazol-4-yl]methanone as white crystals (m.p. 112-113°C). ^{1}H NMR ($CDCl_3$, ppm): 7.97, d, J=7.8 Hz, 1H; 7.67, d, J=7.8 Hz, 1H; 3.128, s, 3H; 2.62, s, 3H; 1.69-1.64, m, 1H; 1.26-1.18, m, 2H; 0.90-0.85, m, 2H.

Example H27: Preparation of (5-cyclopropyl-3-methanesulfonylisoxazol-4-yl)-(2-isopropyl-6-trifluoromethylpyridin-3-yl)methanone:

0.15 g (0.0045 mol) of (5-cyclopropyl-3-methylsulfanylisoxazol-4-yl)-(2-isopropyl-6-trifluoromethylpyridin-3-yl)methanone is dissolved in methylene chloride, and 0.28 ml of peracetic acid (39% in acetic acid, 0.0016 mol) are added dropwise at a temperature of 5°C. After 15 hours at 25°C, the reaction mixture is added to ethyl acetate and water, and the organic phase is washed with water, dried with sodium sulfate and evaporated. The residue is chromatographed over silica gel (mobile phase: ethyl acetate/hexane 5/1). This gives 0.121 g (74% of theory) of the expected product as white crystals (m.p.105-106°C).

In an analogous manner, and according to the methods shown in the general reaction schemes 1-10 and in the references mentioned therein, it is also possible to prepare the compounds listed in the tables below. In these tables, CCH is the ethynyl group, Ph is the phenyl group and Me is the methyl group.

Table 1:



Comp. No.	R_1	R_2	R_3	R_4	R_5	p

Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.001	H	CF_3	H	H	OH	0
1.002	F	CF_3	H	H	OH	0
1.003	Cl	CF_3	H	H	OH	0
1.004	Br	CF_3	H	H	OH	0
1.005	CHF_2	CF_3	H	H	OH	0
1.006	CCl_3	CF_3	H	H	OH	0
1.007	$CClF_2$	CF_3	H	H	OH	0
1.008	CF_3	CF_3	H	H	OH	0
1.009	CH_3	CF_3	H	H	OH	0
1.01	CH_2CH_3	CF_3	H	H	OH	0
1.011	$CH(CH_3)_2$	CF_3	H	H	OH	0
1.012	$(CH_2)_2CH_3$	CF_3	H	H	OH	0
1.013	$C(CH_3)_3$	CF_3	H	H	OH	0
1.014	Ph	CF_3	H	H	OH	0
1.015	CH_2F	CF_3	H	H	OH	0
1.016	CH_2Cl	CF_3	H	H	OH	0
1.017	CH_2Br	CF_3	H	H	OH	0
1.018	CH_2OH	CF_3	H	H	OH	0
1.019	CH_2OCOCH_3	CF_3	H	H	OH	0
1.02	CH_2OCOPh	CF_3	H	H	OH	0
1.021	CH_2OCH_3	CF_3	H	H	OH	0
1.022	$CH_2OCH_2CH_3$	CF_3	H	H	OH	0
1.023	$CH_2CH_2OCH_3$	CF_3	H	H	OH	0
1.024	CH_2SMe	CF_3	H	H	OH	0
1.025	CH_2SOMe	CF_3	H	H	OH	0
1.026	CH_2SO_2Me	CF_3	H	H	OH	0
1.027	CH_2SO_2Ph	CF_3	H	H	OH	0
1.028	SCH_2Ph	CF_3	H	H	OH	0
1.029	$SOCH_2Ph$	CF_3	H	H	OH	0
1.03	SO_2CH_2Ph	CF_3	H	H	OH	0
1.031	SCH_3	CF_3	H	H	OH	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.032	$SOCH_3$	CF_3	H	H	OH	0
1.033	SO_2CH_3	CF_3	H	H	OH	0
1.034	SPh	CF_3	H	H	OH	0
1.035	SOPh	CF_3	H	H	OH	0
1.036	SO_2Ph	CF_3	H	H	OH	0
1.037	$N(CH_3)_2$	CF_3	H	H	OH	0
1.038	$CH=CH_2$	CF_3	H	H	OH	0
1.039	$CH_2CH=CH_2$	CF_3	H	H	OH	0
1.04	$SO_2N(CH_3)_2$	CF_3	H	H	OH	0
1.041	ethynyl	CF_3	H	H	OH	0
1.042	cyclopropyl	CF_3	H	H	OH	0
1.043	OCH_3	CF_3	H	H	OH	0
1.044	OPh	CF_3	H	H	OH	0
1.045	$OCHF_2$	CF_3	H	H	OH	0
1.046	CO_2Me	CF_3	H	H	OH	0
1.047	2-furyl	CF_3	H	H	OH	0
1.048	OCH_2ethynyl	CF_3	H	H	OH	0
1.049	2-pyridyl	CF_3	H	H	OH	0
1.05	3-pyridyl	CF_3	H	H	OH	0
1.051	4-pyridyl	CF_3	H	H	OH	0
1.052	H	CF_3	H	H	OH	1
1.053	F	CF_3	H	H	OH	1
1.054	Cl	CF_3	H	H	OH	1
1.055	Br	CF_3	H	H	OH	1
1.056	CHF_2	CF_3	H	H	OH	1
1.057	CCl_3	CF_3	H	H	OH	1
1.058	$CClF_2$	CF_3	H	H	OH	1
1.059	CF_3	CF_3	H	H	OH	1
1.06	CH_3	CF_3	H	H	OH	1
1.061	CH_2CH_3	CF_3	H	H	OH	1
1.062	$CH(CH_3)_2$	CF_3	H	H	OH	1

Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.063	$(CH_2)_2CH_3$	CF_3	H	H	OH	1
1.064	$C(CH_3)_3$	CF_3	H	H	OH	1
1.065	Ph	CF_3	H	H	OH	1
1.066	CH_2F	CF_3	H	H	OH	1
1.067	CH_2Cl	CF_3	H	H	OH	1
1.068	CH_2Br	CF_3	H	H	OH	1
1.069	CH_2OH	CF_3	H	H	OH	1
1.07	CH_2OCOCH_3	CF_3	H	H	OH	1
1.071	CH_2OCOPh	CF_3	H	H	OH	1
1.072	CH_2OCH_3	CF_3	H	H	OH	1
1.073	$CH_2OCH_2CH_3$	CF_3	H	H	OH	1
1.074	$CH_2CH_2OCH_3$	CF_3	H	H	OH	1
1.075	CH_2SMe	CF_3	H	H	OH	1
1.076	CH_2SOMe	CF_3	H	H	OH	1
1.077	CH_2SO_2Me	CF_3	H	H	OH	1
1.078	CH_2SO_2Ph	CF_3	H	H	OH	1
1.079	SCH_2Ph	CF_3	H	H	OH	1
1.08	$SOCH_2Ph$	CF_3	H	H	OH	1
1.081	SO_2CH_2Ph	CF_3	H	H	OH	1
1.082	SCH_3	CF_3	H	H	OH	1
1.083	$SOCH_3$	CF_3	H	H	OH	1
1.084	SO_2CH_3	CF_3	H	H	OH	1
1.085	SPh	CF_3	H	H	OH	1
1.086	SOPh	CF_3	H	H	OH	1
1.087	SO_2Ph	CF_3	H	H	OH	1
1.088	$N(CH_3)_2$	CF_3	H	H	OH	1
1.089	$CH=CH_2$	CF_3	H	H	OH	1
1.09	$CH_2CH=CH_2$	CF_3	H	H	OH	1
1.091	$SO_2N(CH_3)_2$	CF_3	H	H	OH	1
1.092	ethynyl	CF_3	H	H	OH	1
1.093	cyclopropyl	CF_3	H	H	OH	1

Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.094	OCH_3	CF_3	H	H	OH	1
1.095	OPh	CF_3	H	H	OH	1
1.096	$OCHF_2$	CF_3	H	H	OH	1
1.097	CO_2Me	CF_3	H	H	OH	1
1.098	2-furyl	CF_3	H	H	OH	1
1.099	OCH_2CCH	CF_3	H	H	OH	1
1.1	2-pyridyl	CF_3	H	H	OH	1
1.101	3-pyridyl	CF_3	H	H	OH	1
1.102	4-pyridyl	CF_3	H	H	OH	1
1.103	H	CF_2CF_3	H	H	OH	0
1.104	Cl	CF_2CF_3	H	H	OH	0
1.105	CHF_2	CF_2CF_3	H	H	OH	0
1.106	CCl_3	CF_2CF_3	H	H	OH	0
1.107	$CClF_2$	CF_2CF_3	H	H	OH	0
1.108	CF_3	CF_2CF_3	H	H	OH	0
1.109	CH_3	CF_2CF_3	H	H	OH	0
1.11	CH_2CH_3	CF_2CF_3	H	H	OH	0
1.111	$CH(CH_3)_2$	CF_2CF_3	H	H	OH	0
1.112	$(CH_2)_2CH_3$	CF_2CF_3	H	H	OH	0
1.113	$C(CH_3)_3$	CF_2CF_3	H	H	OH	0
1.114	CH_2F	CF_2CF_3	H	H	OH	0
1.115	CH_2Cl	CF_2CF_3	H	H	OH	0
1.116	CH_2OH	CF_2CF_3	H	H	OH	0
1.117	CH_2OCOCH_3	CF_2CF_3	H	H	OH	0
1.118	CH_2OCOPh	CF_2CF_3	H	H	OH	0
1.119	CH_2OCH_3	CF_2CF_3	H	H	OH	0
1.12	$CH_2OCH_2CH_3$	CF_2CF_3	H	H	OH	0
1.121	CH_2SMe	CF_2CF_3	H	H	OH	0
1.122	CH_2SOMe	CF_2CF_3	H	H	OH	0
1.123	CH_2SO_2Me	CF_2CF_3	H	H	OH	0
1.124	CH_2SO_2Ph	CF_2CF_3	H	H	OH	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.125	$N(CH_3)_2$	CF_2CF_3	H	H	OH	0
1.126	$CH=CH_2$	CF_2CF_3	H	H	OH	0
1.127	$CH_2CH=CH_2$	CF_2CF_3	H	H	OH	0
1.128	$SO_2N(CH_3)_2$	CF_2CF_3	H	H	OH	0
1.129	CCH	CF_2CF_3	H	H	OH	0
1.13	cyclopropyl	CF_2CF_3	H	H	OH	0
1.131	OPh	CF_2CF_3	H	H	OH	0
1.132	OCH_3	CF_2CF_3	H	H	OH	0
1.133	CO_2Me	CF_2CF_3	H	H	OH	0
1.134	OCH_2CCH	CF_2CF_3	H	H	OH	0
1.135	2-pyridyl	CF_2CF_3	H	H	OH	0
1.136	3-pyridyl	CF_2CF_3	H	H	OH	0
1.137	4-pyridyl	CF_2CF_3	H	H	OH	0
1.138	H	CF_2CF_3	H	H	OH	1
1.139	Cl	CF_2CF_3	H	H	OH	1
1.14	CHF_2	CF_2CF_3	H	H	OH	1
1.141	CCl_3	CF_2CF_3	H	H	OH	1
1.142	$CClF_2$	CF_2CF_3	H	H	OH	1
1.143	CF_3	CF_2CF_3	H	H	OH	1
1.144	CH_3	CF_2CF_3	H	H	OH	1
1.145	CH_2CH_3	CF_2CF_3	H	H	OH	1
1.146	$CH(CH_3)_2$	CF_2CF_3	H	H	OH	1
1.147	$(CH_2)_2CH_3$	CF_2CF_3	H	H	OH	1
1.148	$C(CH_3)_3$	CF_2CF_3	H	H	OH	1
1.149	CH_2F	CF_2CF_3	H	H	OH	1
1.15	CH_2Cl	CF_2CF_3	H	H	OH	1
1.151	CH_2OH	CF_2CF_3	H	H	OH	1
1.152	CH_2OCOCH_3	CF_2CF_3	H	H	OH	1
1.153	CH_2OCOPh	CF_2CF_3	H	H	OH	1
1.154	CH_2OCH_3	CF_2CF_3	H	H	OH	1
1.155	$CH_2OCH_2CH_3$	CF_2CF_3	H	H	OH	1

Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.156	CH_2SMe	CF_2CF_3	H	H	OH	1
1.157	CH_2SOMe	CF_2CF_3	H	H	OH	1
1.158	CH_2SO_2Me	CF_2CF_3	H	H	OH	1
1.159	CH_2SO_2Ph	CF_2CF_3	H	H	OH	1
1.16	$N(CH_3)_2$	CF_2CF_3	H	H	OH	1
1.161	$CH=CH_2$	CF_2CF_3	H	H	OH	1
1.162	$CH_2CH=CH_2$	CF_2CF_3	H	H	OH	1
1.163	$SO_2N(CH_3)_2$	CF_2CF_3	H	H	OH	1
1.164	CCH	CF_2CF_3	H	H	OH	1
1.165	cyclopropyl	CF_2CF_3	H	H	OH	1
1.166	OPh	CF_2CF_3	H	H	OH	1
1.167	OCH_3	CF_2CF_3	H	H	OH	1
1.168	CO_2Me	CF_2CF_3	H	H	OH	1
1.169	OCH_2CCH	CF_2CF_3	H	H	OH	1
1.17	2-pyridyl	CF_2CF_3	H	H	OH	1
1.171	3-pyridyl	CF_2CF_3	H	H	OH	1
1.172	4-pyridyl	CF_2CF_3	H	H	OH	1
1.173	H	$CF_2CF_2CF_3$	H	H	OH	0
1.174	CHF_2	$CF_2CF_2CF_3$	H	H	OH	0
1.175	CF_3	$CF_2CF_2CF_3$	H	H	OH	0
1.176	CH_3	$CF_2CF_2CF_3$	H	H	OH	0
1.177	CH_2CH_3	$CF_2CF_2CF_3$	H	H	OH	0
1.178	$(CH_2)_2CH_3$	$CF_2CF_2CF_3$	H	H	OH	0
1.179	CH_2Cl	$CF_2CF_2CF_3$	H	H	OH	0
1.18	CH_2OCH_3	$CF_2CF_2CF_3$	H	H	OH	0
1.181	H	$CF_2CF_2CF_3$	H	H	OH	1
1.182	CHF_2	$CF_2CF_2CF_3$	H	H	OH	1
1.183	CF_3	$CF_2CF_2CF_3$	H	H	OH	1
1.184	CH_3	$CF_2CF_2CF_3$	H	H	OH	1
1.185	CH_2CH_3	$CF_2CF_2CF_3$	H	H	OH	1
1.186	$(CH_2)_2CH_3$	$CF_2CF_2CF_3$	H	H	OH	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.187	CH_2Cl	$CF_2CF_2CF_3$	H	H	OH	1
1.188	CH_2OCH_3	$CF_2CF_2CF_3$	H	H	OH	1
1.189	H	CF_2Cl	H	H	OH	0
1.19	Cl	CF_2Cl	H	H	OH	0
1.191	CHF_2	CF_2Cl	H	H	OH	0
1.192	CCl_3	CF_2Cl	H	H	OH	0
1.193	$CClF_2$	CF_2Cl	H	H	OH	0
1.194	CF_3	CF_2Cl	H	H	OH	0
1.195	CH_3	CF_2Cl	H	H	OH	0
1.196	CH_2CH_3	CF_2Cl	H	H	OH	0
1.197	$CH(CH_3)_2$	CF_2Cl	H	H	OH	0
1.198	$(CH_2)_2CH_3$	CF_2Cl	H	H	OH	0
1.199	$C(CH_3)_3$	CF_2Cl	H	H	OH	0
1.2	CH_2F	CF_2Cl	H	H	OH	0
1.201	CH_2Cl	CF_2Cl	H	H	OH	0
1.202	CH_2OH	CF_2Cl	H	H	OH	0
1.203	CH_2OCOCH_3	CF_2Cl	H	H	OH	0
1.204	CH_2OCOPh	CF_2Cl	H	H	OH	0
1.205	CH_2OCH_3	CF_2Cl	H	H	OH	0
1.206	$CH_2OCH_2CH_3$	CF_2Cl	H	H	OH	0
1.207	CH_2SMe	CF_2Cl	H	H	OH	0
1.208	CH_2SOMe	CF_2Cl	H	H	OH	0
1.209	CH_2SO_2Me	CF_2Cl	H	H	OH	0
1.21	CH_2SO_2Ph	CF_2Cl	H	H	OH	0
1.211	$N(CH_3)_2$	CF_2Cl	H	H	OH	0
1.212	$CH=CH_2$	CF_2Cl	H	H	OH	0
1.213	$CH_2CH=CH_2$	CF_2Cl	H	H	OH	0
1.214	$SO_2N(CH_3)_2$	CF_2Cl	H	H	OH	0
1.215	CCH	CF_2Cl	H	H	OH	0
1.216	cyclopropyl	CF_2Cl	H	H	OH	0
1.217	OPh	CF_2Cl	H	H	OH	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.218	OCH_3	CF_2Cl	H	H	OH	0
1.219	CO_2Me	CF_2Cl	H	H	OH	0
1.22	OCH_2CCH	CF_2Cl	H	H	OH	0
1.221	2-pyridyl	CF_2Cl	H	H	OH	0
1.222	3-pyridyl	CF_2Cl	H	H	OH	0
1.223	4-pyridyl	CF_2Cl	H	H	OH	0
1.224	H	CF_2Cl	H	H	OH	1
1.225	Cl	CF_2Cl	H	H	OH	1
1.226	CHF_2	CF_2Cl	H	H	OH	1
1.227	CCl_3	CF_2Cl	H	H	OH	1
1.228	$CClF_2$	CF_2Cl	H	H	OH	1
1.229	CF_3	CF_2Cl	H	H	OH	1
1.23	CH_3	CF_2Cl	H	H	OH	1
1.231	CH_2CH_3	CF_2Cl	H	H	OH	1
1.232	$CH(CH_3)_2$	CF_2Cl	H	H	OH	1
1.233	$(CH_2)_2CH_3$	CF_2Cl	H	H	OH	1
1.234	$C(CH_3)_3$	CF_2Cl	H	H	OH	1
1.235	CH_2F	CF_2Cl	H	H	OH	1
1.236	CH_2Cl	CF_2Cl	H	H	OH	1
1.237	CH_2OH	CF_2Cl	H	H	OH	1
1.238	CH_2OCOCH_3	CF_2Cl	H	H	OH	1
1.239	CH_2OCOPh	CF_2Cl	H	H	OH	1
1.24	CH_2OCH_3	CF_2Cl	H	H	OH	1
1.241	$CH_2OCH_2CH_3$	CF_2Cl	H	H	OH	1
1.242	CH_2SMe	CF_2Cl	H	H	OH	1
1.243	CH_2SOMe	CF_2Cl	H	H	OH	1
1.244	CH_2SO_2Me	CF_2Cl	H	H	OH	1
1.245	CH_2SO_2Ph	CF_2Cl	H	H	OH	1
1.246	$N(CH_3)_2$	CF_2Cl	H	H	OH	1
1.247	$CH=CH_2$	CF_2Cl	H	H	OH	1
1.248	$CH_2CH=CH_2$	CF_2Cl	H	H	OH	1

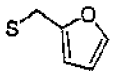
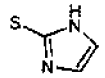
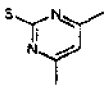
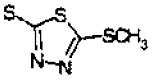
Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.249	$SO_2N(CH_3)_2$	CF_2Cl	H	H	OH	1
1.25	CCH	CF_2Cl	H	H	OH	1
1.251	cyclopropyl	CF_2Cl	H	H	OH	1
1.252	OPh	CF_2Cl	H	H	OH	1
1.253	OCH_3	CF_2Cl	H	H	OH	1
1.254	CO_2Me	CF_2Cl	H	H	OH	1
1.255	OCH_2CCH	CF_2Cl	H	H	OH	1
1.256	H	CCl_3	H	H	OH	0
1.257	Cl	CCl_3	H	H	OH	0
1.258	CH_3	CCl_3	H	H	OH	0
1.259	CH_2CH_3	CCl_3	H	H	OH	0
1.26	$CH(CH_3)_2$	CCl_3	H	H	OH	0
1.261	$(CH_2)_2CH_3$	CCl_3	H	H	OH	0
1.262	CH_2F	CCl_3	H	H	OH	0
1.263	CH_2Cl	CCl_3	H	H	OH	0
1.264	CH_2OH	CCl_3	H	H	OH	0
1.265	CH_2OCOCH_3	CCl_3	H	H	OH	0
1.266	CH_2OCOPh	CCl_3	H	H	OH	0
1.267	CH_2OCH_3	CCl_3	H	H	OH	0
1.268	$CH_2OCH_2CH_3$	CCl_3	H	H	OH	0
1.269	CH_2SMe	CCl_3	H	H	OH	0
1.27	CH_2SOMe	CCl_3	H	H	OH	0
1.271	CH_2SO_2Me	CCl_3	H	H	OH	0
1.272	CH_2SO_2Ph	CCl_3	H	H	OH	0
1.273	cyclopropyl	CCl_3	H	H	OH	0
1.274	OPh	CCl_3	H	H	OH	0
1.275	OCH_3	CCl_3	H	H	OH	0
1.276	CO_2Me	CCl_3	H	H	OH	0
1.277	OCH_2CCH	CCl_3	H	H	OH	0
1.278	H	CCl_3	H	H	OH	1
1.279	Cl	CCl_3	H	H	OH	1

Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.28	CH_3	CCl_3	H	H	OH	1
1.281	CH_2CH_3	CCl_3	H	H	OH	1
1.282	$CH(CH_3)_2$	CCl_3	H	H	OH	1
1.283	$(CH_2)_2CH_3$	CCl_3	H	H	OH	1
1.284	CH_2F	CCl_3	H	H	OH	1
1.285	CH_2Cl	CCl_3	H	H	OH	1
1.286	CH_2OH	CCl_3	H	H	OH	1
1.287	CH_2OCOCH_3	CCl_3	H	H	OH	1
1.288	CH_2OCOPh	CCl_3	H	H	OH	1
1.289	CH_2OCH_3	CCl_3	H	H	OH	1
1.29	$CH_2OCH_2CH_3$	CCl_3	H	H	OH	1
1.291	CH_2SMe	CCl_3	H	H	OH	1
1.292	CH_2SOMe	CCl_3	H	H	OH	1
1.293	CH_2SO_2Me	CCl_3	H	H	OH	1
1.294	CH_2SO_2Ph	CCl_3	H	H	OH	1
1.295	cyclopropyl	CCl_3	H	H	OH	1
1.296	OPh	CCl_3	H	H	OH	1
1.297	OCH_3	CCl_3	H	H	OH	1
1.298	CO_2Me	CCl_3	H	H	OH	1
1.299	OCH_2CCH	CCl_3	H	H	OH	1
1.3	CF_3	CHF_2	H	H	OH	0
1.301	CH_3	CHF_2	H	H	OH	0
1.302	CH_2OCH_3	CHF_2	H	H	OH	0
1.303	CH_2Cl	CHF_2	H	H	OH	0
1.304	CH_2F	CHF_2	H	H	OH	0
1.305	CF_3	CHF_2	H	H	OH	1
1.306	CH_3	CHF_2	H	H	OH	1
1.307	CH_2OCH_3	CHF_2	H	H	OH	1
1.308	CH_2Cl	CHF_2	H	H	OH	1
1.309	CH_2F	CHF_2	H	H	OH	1
1.31	CH_3	CF_3	H	CH_3	OH	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.311	CH_3	CF_3	H	CH_3	OH	1
1.312	Cl	CF_3	H	CH_3	OH	0
1.313	CH_3	CF_3	CH_3	H	OH	0
1.314	CH_3	CF_3	Ph	H	OH	0
1.315	CH_3	CF_3	Cl	H	OH	0
1.316	CH_3	CF_3	$CO_2CH_2CH_3$	H	OH	0
1.317	CH_3	CF_3	CO_2CH_2Ph	H	OH	0
1.318	CH_3	CF_3	CH_3	H	OH	1
1.319	CH_3	CF_3	Ph	H	OH	1
1.32	CH_3	CF_3	Cl	H	OH	1
1.321	CH_3	CF_3	$CO_2CH_2CH_3$	H	OH	1
1.322	CH_3	CF_3	CO_2CH_2Ph	H	OH	1
1.323	OCH_3	CF_3	CH_3	H	OH	0
1.324	CH_2OCH_3	CF_3	CH_3	H	OH	0
1.325	CH_2OCH_3	CF_3	Ph	H	OH	0
1.326	CH_2OCH_3	CF_3	Cl	H	OH	0
1.327	CH_2OCH_3	CF_3	$CO_2CH_2CH_3$	H	OH	0
1.328	CH_2OCH_3	CF_3	CO_2CH_2Ph	H	OH	0
1.329	CH_2OCH_3	CF_3	CH_3	H	OH	1
1.33	CH_2OCH_3	CF_3	Ph	H	OH	1
1.331	CH_2OCH_3	CF_3	Cl	H	OH	1
1.332	CH_2OCH_3	CF_3	$CO_2CH_2CH_3$	H	OH	1
1.333	CH_2OCH_3	CF_3	CO_2CH_2Ph	H	OH	1
1.334	$COOCH_3$	H	H	H	OH	0
1.335	CF_3	SCH_3	H	H	OH	0
1.336	CH_3	SCH_3	H	H	OH	0
1.337	CF_3	$SOCH_3$	H	H	OH	0
1.338	CH_3	$SOCH_3$	H	H	OH	0
1.339	CF_3	SO_2CH_3	H	H	OH	0
1.34	CH_3	SO_2CH_3	H	H	OH	0
1.341	CF_3	SCH_2CH_3	H	H	OH	0

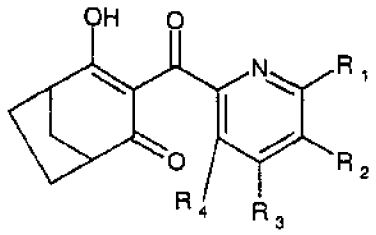
Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.342	CH_3	SCH_2CH_3	H	H	OH	0
1.343	CF_3	$SOCH_2CH_3$	H	H	OH	0
1.344	CH_3	$SOCH_2CH_3$	H	H	OH	0
1.345	CF_3	$SO_2CH_2CH_3$	H	H	OH	0
1.346	CH_3	$SO_2CH_2CH_3$	H	H	OH	0
1.347	CF_3	OCH_3	H	H	OH	0
1.348	CH_3	OCH_3	H	H	OH	0
1.349	CF_3	OCH_2CF_3	H	H	OH	0
1.35	CH_3	OCH_2CF_3	H	H	OH	0
1.351	CF_3	OCH_2CCH	H	H	OH	0
1.352	CH_3	OCH_2CCH	H	H	OH	0
1.353	CF_3	CN	H	H	OH	0
1.354	CH_3	CN	H	H	OH	0
1.355	CF_3	Cl	H	H	OH	0
1.356	CF_3	Cl	H	H	O-NEt_3+	0
1.357	CH_3	Cl	H	H	OH	0
1.358	H	Cl	H	H	OH	0
1.359	CF_3	OCH_3	H	H	OH	0
1.36	CH_3	OCH_3	H	H	OH	0
1.361	CF_3	CH_3	H	H	OH	0
1.362	H	CF_3	H	CH_3	OH	0
1.363	H	CF_3	H	CF_3	OH	0
1.364	H	CF_3	H	CH_2CH_3	OH	0
1.365	H	CF_3	H	CF_3	OH	0
1.366	H	CF_3	H	SCH_3	OH	0
1.367	H	CF_3	H	$SOCH_3$	OH	0
1.368	H	CF_3	H	SO_2CH_3	OH	0
1.369	H	CF_3	H	Cl	OH	0
1.37	H	CF_3	H	OCH_3	OH	0
1.371	H	CH_3	H	CF_3	OH	0
1.372	H	Cl	H	CF_3	OH	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.373	H	OCH_3	H	CF_3	OH	0
1.374	H	SCH_3	H	CF_3	OH	0
1.375	H	$SOCH_3$	H	CF_3	OH	0
1.376	CH_3	CF_3	H	H	O-K+	0
1.377	CH_3	CF_3	H	H	$S(CH_2)_7CH_3$	0
1.378	CH_3	CF_3	H	H	$S(CH_2)_7CH_3$	0
1.379	CH_3	CF_3	H	H	$SO(CH_2)_7CH_3$	0
1.38	CH_3	CF_3	H	H	$SO_2(CH_2)_7CH_3$	0
1.381	CH_3	CF_3	H	H	SPh	0
1.382	CH_3	CF_3	H	H	SOPh	0
1.383	CH_3	CF_3	H	H	SO_2Ph	0
1.384	CH_3	CF_3	H	H	$NOCH_3$	0
1.385	CH_3	CF_3	H	H	$NOCH_2Ph$	0
1.386	CH_3	CF_3	H	H	$NOCH_2CH=CH_2$	0
1.387	CH_3	CF_3	H	H	$NOC(CH_3)_3$	0
1.388	CH_3	CF_3	H	H	$NOCH_2CH_3$	0
1.389	CH_3	CF_3	H	H	NCH_2CH_2SH	0
1.39	CH_3	CF_3	H	H	$NN(CH_3)_2$	0
1.391	CH_3	CF_3	H	H	$NN(CH_3)C(S)NH_2$	0
1.392	CH_3	CF_3	H	H	N-morpholino	0
1.393	CH_3	CF_3	H	H	$NHCOCH_3$	0
1.394	CH_3	CF_3	H	H	$NHCO(CH_2)_7CH_3$	0
1.395	CH_3	CF_3	H	H	NHCOPh	0
1.396	CH_3	CF_3	H	H	$NHSO_2CH_3$	0
1.397	CH_3	CF_3	H	H	$NH(CO)S(CH_2)_7CH_3$	0
1.398	CH_3	CF_3	H	H	Cl	0
1.399	CH_3	CF_3	H	H	NH_2	0
1.4	CH_3	CF_3	H	H	$OCOC(CH_3)_3$	0
1.401	CH_3	CF_3	H	H	$OCOCH_3$	0
1.402	CH_3	CF_3	H	H	OCOPh	0
1.403	CH_3	CF_3	H	H	OCO-cyclopropyl	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.404	CH_3	CF_3	H	H	$OCOCH_2CH_3$	0
1.405	CH_3	CF_3	H	H	$OCOCH=CH_2$	0
1.406	CH_3	CF_3	H	H	$OCOCH=CHCH_3$	0
1.407	CH_3	CF_3	H	H	$O(CO)SCH_3$	0
1.408	CH_3	CF_3	H	H	$O(CO)S(CH_2)_7CH_3$	0
1.409	CH_3	CF_3	H	H	$O(CO)OCH_2CH_3$	0
1.41	CH_3	CF_3	H	H	$O(CO)N(CH_2CH_3)_2$	0
1.411	CH_3	$(CF_2)_3CF_3$	H	H	OH	0
1.412	CH_3	CF_3	H	H	S-(4-Cl-phenyl)	0
1.413	CH_3	CF_3	H	H	SO-(4-Cl-phenyl)	0
1.414	CH_3	CF_3	H	H	SO_2-(4-Cl-phenyl)	0
1.415	CH_3	CF_3	H	H	S-(4-CF_3-phenyl)	0
1.416	CH_3	CF_3	H	H	SO-(4-CF_3-phenyl)	0
1.417	CH_3	CF_3	H	H	SO_2-(4-CF_3-phenyl)	0
1.418	CH_3	CF_3	H	H	S-(4-NO_2-phenyl)	0
1.419	CH_3	CF_3	H	H	SO-(4-NO_2-phenyl)	0
1.42	CH_3	CF_3	H	H	SO_2-(4-NO_2-phenyl)	0
1.421	CH_3	CF_3	H	H		0
1.422	CH_3	CF_3	H	H		0
1.423	CH_3	CF_3	H	H		0
1.424	CH_3	CF_3	H	H		0
1.425	CF_2H	SCH_3	H	H	OH	0
1.426	CF_2Cl	SCH_3	H	H	OH	0
1.427	CF_2H	$SOCH_3$	H	H	OH	0
1.428	CF_2Cl	$SOCH_3$	H	H	OH	0
1.429	CF_2H	SO_2CH_3	H	H	OH	0
1.43	CF_2Cl	SO_2CH_3	H	H	OH	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	p
1.431	CF_2H	SCH_2CH_3	H	H	OH	0
1.432	CF_2Cl	SCH_2CH_3	H	H	OH	0
1.433	CF_2H	$SOCH_2CH_3$	H	H	OH	0
1.434	CF_2Cl	$SOCH_2CH_3$	H	H	OH	0
1.435	CF_2H	$SO_2CH_2CH_3$	H	H	OH	0
1.436	CF_2Cl	$SO_2CH_2CH_3$	H	H	OH	0
1.437	CF_2H	OCH_3	H	H	OH	0
1.438	CF_2Cl	OCH_3	H	H	OH	0
1.439	CF_2H	OCH_2CF_3	H	H	OH	0
1.44	CF_2Cl	OCH_2CF_3	H	H	OH	0
1.441	CF_2H	OCH_2CCH	H	H	OH	0
1.442	CF_2Cl	OCH_2CCH	H	H	OH	0
1.443	CF_2H	CN	H	H	OH	0
1.444	CF_2Cl	CN	H	H	OH	0
1.445	CF_2H	Cl	H	H	OH	0
1.446	CF_2Cl	Cl	H	H	OH	0
1.447	CF_2H	OCH_3	H	H	OH	0
1.448	CF_2Cl	OCH_3	H	H	OH	0
1.449	CF_3	CH_2OCH_3	H	H	OH	0
1.45	CF_3	CH_2OCH_3	H	H	OH	1
1.451	CF_2Cl	CH_2OCH_3	H	H	OH	0
1.452	CF_2Cl	CH_2OCH_3	H	H	OH	1
1.453	CF_2H	CH_2OCH_3	H	H	OH	0
1.454	CF_2H	CH_2OCH_3	H	H	OH	1
1.455	CN	CF_3	H	H	OH	0

Table 2:



Comp. No.	R_1	R_2	R_3	R_4
2.001	H	CF_3	H	H
2.002	F	CF_3	H	H
2.003	Cl	CF_3	H	H
2.004	Br	CF_3	H	H
2.005	CHF_2	CF_3	H	H
2.006	CCl_3	CF_3	H	H
2.007	$CClF_2$	CF_3	H	H
2.008	CF_3	CF_3	H	H
2.009	CH_3	CF_3	H	H
2.01	CH_2CH_3	CF_3	H	H
2.011	$CH(CH_3)_2$	CF_3	H	H
2.012	$(CH_2)_2CH_3$	CF_3	H	H
2.013	Ph	CF_3	H	H
2.014	CH_2F	CF_3	H	H
2.015	CH_2Cl	CF_3	H	H
2.016	CH_2Br	CF_3	H	H
2.017	CH_2OH	CF_3	H	H
2.018	CH_2OCOCH_3	CF_3	H	H
2.019	CH_2OCOPh	CF_3	H	H
2.02	CH_2OCH_3	CF_3	H	H
2.021	$CH_2OCH_2CH_3$	CF_3	H	H
2.022	$CH_2CH_2OCH_3$	CF_3	H	H
2.023	CH_2SMe	CF_3	H	H
2.024	CH_2SOMe	CF_3	H	H
2.025	CH_2SO_2Me	CF_3	H	H
2.026	CH_2SO_2Ph	CF_3	H	H

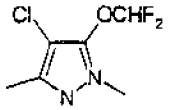
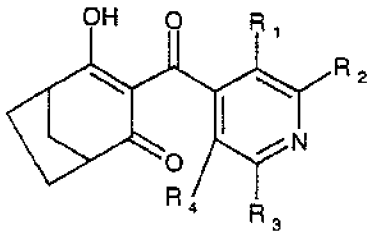
Comp. No.	R_1	R_2	R_3	R_4
2.027	SCH_2Ph	CF_3	H	H
2.028	$SOCH_2Ph$	CF_3	H	H
2.029	SO_2CH_2Ph	CF_3	H	H
2.03	SCH_3	CF_3	H	H
2.031	$SOCH_3$	CF_3	H	H
2.032	SO_2CH_3	CF_3	H	H
2.033	$N(CH_3)_2$	CF_3	H	H
2.034	$CH=CH_2$	CF_3	H	H
2.035	$CH_2CH=CH_2$	CF_3	H	H
2.036	$SO_2N(CH_3)_2$	CF_3	H	H
2.037	CCH	CF_3	H	H
2.038	OCH_3	CF_3	H	H
2.039	OPh	CF_3	H	H
2.04	$OCHF_2$	CF_3	H	H
2.041	CO_2Me	CF_3	H	H
2.042	OCH_2CCH	CF_3	H	H
2.043	OCH_2CF_3	CF_3	H	H
2.044	H	CF_3	H	Cl
2.045		F	H	Cl
2.046	CN	CF_3	H	H
2.047	H	CHF_2	H	H
2.048	CH_3	CHF_2	H	H
2.049	CH_2CH_3	CHF_2	H	H
2.05	CH_2OCH_3	CHF_2	H	H
2.051	H	CF_2Cl	H	H
2.052	CH_3	CF_2Cl	H	H
2.053	CH_2CH_3	CF_2Cl	H	H
2.054	CH_2OCH_3	CF_2Cl	H	H

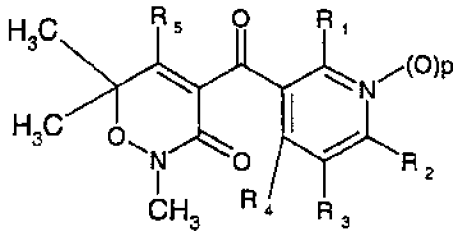
Table 3:



Comp. No.	R_1	R_2	R_3	R_4
3.001	H	CF_3	H	H
3.002	F	CF_3	H	H
3.003	Cl	CF_3	H	H
3.004	Br	CF_3	H	H
3.005	CHF_2	CF_3	H	H
3.006	CCl_3	CF_3	H	H
3.007	$CClF_2$	CF_3	H	H
3.008	CF_3	CF_3	H	H
3.009	CH_3	CF_3	H	H
3.01	CH_2CH_3	CF_3	H	H
3.011	$CH(CH_3)_2$	CF_3	H	H
3.012	$(CH_2)_2CH_3$	CF_3	H	H
3.013	Ph	CF_3	H	H
3.014	CH_2F	CF_3	H	H
3.015	CH_2Cl	CF_3	H	H
3.016	CH_2Br	CF_3	H	H
3.017	CH_2OH	CF_3	H	H
3.018	CH_2OCOCH_3	CF_3	H	H
3.019	CH_2OCOPh	CF_3	H	H
3.02	CH_2OCH_3	CF_3	H	H
3.021	$CH_2OCH_2CH_3$	CF_3	H	H
3.022	$CH_2CH_2OCH_3$	CF_3	H	H
3.023	CH_2SMe	CF_3	H	H
3.024	CH_2SOMe	CF_3	H	H
3.025	CH_2SO_2Me	CF_3	H	H

Comp. No.	R_1	R_2	R_3	R_4
3.026	CH_2SO_2Ph	CF_3	H	H
3.027	SCH_2Ph	CF_3	H	H
3.028	$SOCH_2Ph$	CF_3	H	H
3.029	SO_2CH_2Ph	CF_3	H	H
3.03	SCH_3	CF_3	H	H
3.031	$SOCH_3$	CF_3	H	H
3.032	SO_2CH_3	CF_3	H	H
3.033	$N(CH_3)_2$	CF_3	H	H
3.034	$CH=CH_2$	CF_3	H	H
3.035	$CH_2CH=CH_2$	CF_3	H	H
3.036	$SO_2N(CH_3)_2$	CF_3	H	H
3.037	CCH	CF_3	H	H
3.038	OCH_3	CF_3	H	H
3.039	OPh	CF_3	H	H
3.04	$OCHF_2$	CF_3	H	H
3.041	CO_2Me	CF_3	H	H
3.042	OCH_2CCH	CF_3	H	H
3.043	OCH_2CF_3	CF_3	H	H
3.044	H	CF_3	H	H
3.045	CN	CF_3	H	H
3.046	H	CHF_2	H	H
3.047	CH_3	CHF_2	H	H
3.048	CH_2CH_3	CHF_2	H	H
3.049	CH_2OCH_3	CHF_2	H	H
3.05	H	CF_2Cl	H	H
3.051	CH_3	CF_2Cl	H	H
3.052	CH_2CH_3	CF_2Cl	H	H
3.053	CH_2OCH_3	CF_2Cl	H	H
3.054	Cl	CH_3	H	H
3.055	CN	SCH_3	H	H
3.056	CN	SO_2CH_3	H	H

Table 4:



Comp. No.	R_1	R_2	R_3	R_4	R_5	P
4.001	H	CF_3	H	H	OH	0
4.002	F	CF_3	H	H	OH	0
4.003	Cl	CF_3	H	H	OH	0
4.004	Br	CF_3	H	H	OH	0
4.005	CHF_2	CF_3	H	H	OH	0
4.006	CCl_3	CF_3	H	H	OH	0
4.007	$CClF_2$	CF_3	H	H	OH	0
4.008	CF_3	CF_3	H	H	OH	0
4.009	CH_3	CF_3	H	H	OH	0
4.01	CH_2CH_3	CF_3	H	H	OH	0
4.011	$CH(CH_3)_2$	CF_3	H	H	OH	0
4.012	$(CH_2)_2CH_3$	CF_3	H	H	OH	0
4.013	$C(CH_3)_3$	CF_3	H	H	OH	0
4.014	Ph	CF_3	H	H	OH	0
4.015	CH_2F	CF_3	H	H	OH	0
4.016	CH_2Cl	CF_3	H	H	OH	0
4.017	CH_2Br	CF_3	H	H	OH	0
4.018	CH_2OH	CF_3	H	H	OH	0
4.019	CH_2OCOCH_3	CF_3	H	H	OH	0
4.02	CH_2OCOPh	CF_3	H	H	OH	0
4.021	CH_2OCH_3	CF_3	H	H	OH	0
4.022	$CH_2OCH_2CH_3$	CF_3	H	H	OH	0
4.023	$CH_2CH_2OCH_3$	CF_3	H	H	OH	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	P
4.024	CH_2SMe	CF_3	H	H	OH	0
4.025	CH_2SOMe	CF_3	H	H	OH	0
4.026	CH_2SO_2Me	CF_3	H	H	OH	0
4.027	CH_2SO_2Ph	CF_3	H	H	OH	0
4.028	$N(CH_3)_2$	CF_3	H	H	OH	0
4.029	$CH=CH_2$	CF_3	H	H	OH	0
4.03	$CH_2CH=CH_2$	CF_3	H	H	OH	0
4.031	$SO_2N(CH_3)_2$	CF_3	H	H	OH	0
4.032	CCH	CF_3	H	H	OH	0
4.033	cyclopropyl	CF_3	H	H	OH	0
4.034	OCH_3	CF_3	H	H	OH	0
4.035	OPh	CF_3	H	H	OH	0
4.036	$OCHF_2$	CF_3	H	H	OH	0
4.037	CO_2Me	CF_3	H	H	OH	0
4.038	OCH_2CCH	CF_3	H	H	OH	0
4.039	H	CF_3	H	H	OH	1
4.04	F	CF_3	H	H	OH	1
4.041	Cl	CF_3	H	H	OH	1
4.042	Br	CF_3	H	H	OH	1
4.043	CHF_2	CF_3	H	H	OH	1
4.044	CCl_3	CF_3	H	H	OH	1
4.045	$CClF_2$	CF_3	H	H	OH	1
4.046	CF_3	CF_3	H	H	OH	1
4.047	CH_3	CF_3	H	H	OH	1
4.048	CH_2CH_3	CF_3	H	H	OH	1
4.049	$CH(CH_3)_2$	CF_3	H	H	OH	1
4.05	$(CH_2)_2CH_3$	CF_3	H	H	OH	1
4.051	$C(CH_3)_3$	CF_3	H	H	OH	1
4.052	Ph	CF_3	H	H	OH	1
4.053	CH_2F	CF_3	H	H	OH	1
4.054	CH_2Cl	CF_3	H	H	OH	1

Comp. No.	R_1	R_2	R_3	R_4	R_5	P
4.055	CH_2Br	CF_3	H	H	OH	1
4.056	CH_2OH	CF_3	H	H	OH	1
4.057	CH_2OCOCH_3	CF_3	H	H	OH	1
4.058	CH_2OCOPh	CF_3	H	H	OH	1
4.059	CH_2OCH_3	CF_3	H	H	OH	1
4.06	$CH_2OCH_2CH_3$	CF_3	H	H	OH	1
4.061	$CH_2CH_2OCH_3$	CF_3	H	H	OH	1
4.062	CH_2SMe	CF_3	H	H	OH	1
4.063	CH_2SOMe	CF_3	H	H	OH	1
4.064	CH_2SO_2Me	CF_3	H	H	OH	1
4.065	CH_2SO_2Ph	CF_3	H	H	OH	1
4.066	$N(CH_3)_2$	CF_3	H	H	OH	1
4.067	$CH=CH_2$	CF_3	H	H	OH	1
4.068	$CH_2CH=CH_2$	CF_3	H	H	OH	1
4.069	$SO_2N(CH_3)_2$	CF_3	H	H	OH	1
4.07	CCH	CF_3	H	H	OH	1
4.071	cyclopropyl	CF_3	H	H	OH	1
4.072	OCH_3	CF_3	H	H	OH	1
4.073	OPh	CF_3	H	H	OH	1
4.074	$OCHF_2$	CF_3	H	H	OH	1
4.075	CO_2Me	CF_3	H	H	OH	1
4.076	2-furyl	CF_3	H	H	OH	1
4.077	OCH_2CCH	CF_3	H	H	OH	1
4.078	H	CF_2CF_3	H	H	OH	0
4.079	Cl	CF_2CF_3	H	H	OH	0
4.08	CHF_2	CF_2CF_3	H	H	OH	0
4.081	CCl_3	CF_2CF_3	H	H	OH	0
4.082	$CClF_2$	CF_2CF_3	H	H	OH	0
4.083	CF_3	CF_2CF_3	H	H	OH	0
4.084	CH_3	CF_2CF_3	H	H	OH	0
4.085	CH_2CH_3	CF_2CF_3	H	H	OH	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	P
4.086	$CH(CH_3)_2$	CF_2CF_3	H	H	OH	0
4.087	$(CH_2)_2CH_3$	CF_2CF_3	H	H	OH	0
4.088	$C(CH_3)_3$	CF_2CF_3	H	H	OH	0
4.089	CH_2F	CF_2CF_3	H	H	OH	0
4.09	CH_2Cl	CF_2CF_3	H	H	OH	0
4.091	CH_2OH	CF_2CF_3	H	H	OH	0
4.092	CH_2OCOCH_3	CF_2CF_3	H	H	OH	0
4.093	CH_2OCOPh	CF_2CF_3	H	H	OH	0
4.094	CH_2OCH_3	CF_2CF_3	H	H	OH	0
4.095	$CH_2OCH_2CH_3$	CF_2CF_3	H	H	OH	0
4.096	CH_2SMe	CF_2CF_3	H	H	OH	0
4.097	CH_2SOMe	CF_2CF_3	H	H	OH	0
4.098	CH_2SO_2Me	CF_2CF_3	H	H	OH	0
4.099	CH_2SO_2Ph	CF_2CF_3	H	H	OH	0
4.1	$N(CH_3)_2$	CF_2CF_3	H	H	OH	0
4.101	$CH=CH_2$	CF_2CF_3	H	H	OH	0
4.102	$CH_2CH=CH_2$	CF_2CF_3	H	H	OH	0
4.103	$SO_2N(CH_3)_2$	CF_2CF_3	H	H	OH	0
4.104	CCH	CF_2CF_3	H	H	OH	0
4.105	cyclopropyl	CF_2CF_3	H	H	OH	0
4.106	OPh	CF_2CF_3	H	H	OH	0
4.107	OCH_3	CF_2CF_3	H	H	OH	0
4.108	CO_2Me	CF_2CF_3	H	H	OH	0
4.109	OCH_2CCH	CF_2CF_3	H	H	OH	0
4.11	H	$CF_2CF_2CF_3$	H	H	OH	0
4.111	CHF_2	$CF_2CF_2CF_3$	H	H	OH	0
4.112	CF_3	$CF_2CF_2CF_3$	H	H	OH	0
4.113	CH_3	$CF_2CF_2CF_3$	H	H	OH	0
4.114	CH_2CH_3	$CF_2CF_2CF_3$	H	H	OH	0
4.115	$(CH_2)_2CH_3$	$CF_2CF_2CF_3$	H	H	OH	0
4.116	CH_2Cl	$CF_2CF_2CF_3$	H	H	OH	0

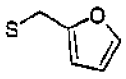
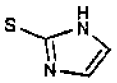
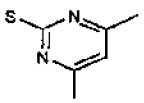
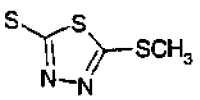
Comp. No.	R_1	R_2	R_3	R_4	R_5	P
4.117	CH_2OCH_3	$CF_2CF_2CF_3$	H	H	OH	0
4.118	H	CF_2Cl	H	H	OH	0
4.119	Cl	CF_2Cl	H	H	OH	0
4.12	CHF_2	CF_2Cl	H	H	OH	0
4.121	CCl_3	CF_2Cl	H	H	OH	0
4.122	$CClF_2$	CF_2Cl	H	H	OH	0
4.123	CF_3	CF_2Cl	H	H	OH	0
4.124	CH_3	CF_2Cl	H	H	OH	0
4.125	CH_2CH_3	CF_2Cl	H	H	OH	0
4.126	$CH(CH_3)_2$	CF_2Cl	H	H	OH	0
4.127	$(CH_2)_2CH_3$	CF_2Cl	H	H	OH	0
4.128	$C(CH_3)_3$	CF_2Cl	H	H	OH	0
4.129	CH_2F	CF_2Cl	H	H	OH	0
4.13	CH_2Cl	CF_2Cl	H	H	OH	0
4.131	CH_2OH	CF_2Cl	H	H	OH	0
4.132	CH_2OCOCH_3	CF_2Cl	H	H	OH	0
4.133	CH_2OCOPh	CF_2Cl	H	H	OH	0
4.134	CH_2OCH_3	CF_2Cl	H	H	OH	0
4.135	$CH_2OCH_2CH_3$	CF_2Cl	H	H	OH	0
4.136	CH_2SMe	CF_2Cl	H	H	OH	0
4.137	CH_2SOMe	CF_2Cl	H	H	OH	0
4.138	CH_2SO_2Me	CF_2Cl	H	H	OH	0
4.139	CH_2SO_2Ph	CF_2Cl	H	H	OH	0
4.14	$N(CH_3)_2$	CF_2Cl	H	H	OH	0
4.141	$CH=CH_2$	CF_2Cl	H	H	OH	0
4.142	$CH_2CH=CH_2$	CF_2Cl	H	H	OH	0
4.143	$SO_2N(CH_3)_2$	CF_2Cl	H	H	OH	0
4.144	CCH	CF_2Cl	H	H	OH	0
4.145	cyclopropyl	CF_2Cl	H	H	OH	0
4.146	OPh	CF_2Cl	H	H	OH	0
4.147	OCH_3	CF_2Cl	H	H	OH	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	P
4.148	CO_2Me	CF_2Cl	H	H	OH	0
4.149	OCH_2CCH	CF_2Cl	H	H	OH	0
4.15	CH_3	CF_2Cl	H	H	OH	1
4.151	CH_2OCH_3	CF_2Cl	H	H	OH	1
4.152	H	CCl_3	H	H	OH	0
4.153	Cl	CCl_3	H	H	OH	0
4.154	CH_3	CCl_3	H	H	OH	0
4.155	CH_2CH_3	CCl_3	H	H	OH	0
4.156	$CH(CH_3)_2$	CCl_3	H	H	OH	0
4.157	$(CH_2)_2CH_3$	CCl_3	H	H	OH	0
4.158	CH_2F	CCl_3	H	H	OH	0
4.159	CH_2Cl	CCl_3	H	H	OH	0
4.16	CH_2OH	CCl_3	H	H	OH	0
4.161	CH_2OCOCH_3	CCl_3	H	H	OH	0
4.162	CH_2OCOPh	CCl_3	H	H	OH	0
4.163	CH_2OCH_3	CCl_3	H	H	OH	0
4.164	$CH_2OCH_2CH_3$	CCl_3	H	H	OH	0
4.165	CH_2SMe	CCl_3	H	H	OH	0
4.166	CH_2SOMe	CCl_3	H	H	OH	0
4.167	CH_2SO_2Me	CCl_3	H	H	OH	0
4.168	CH_2SO_2Ph	CCl_3	H	H	OH	0
4.169	cyclopropyl	CCl_3	H	H	OH	0
4.17	OPh	CCl_3	H	H	OH	0
4.171	OCH_3	CCl_3	H	H	OH	0
4.172	CO_2Me	CCl_3	H	H	OH	0
4.173	OCH_2CCH	CCl_3	H	H	OH	0
4.174	CF_3	CHF_2	H	H	OH	0
4.175	CH_3	CHF_2	H	H	OH	0
4.176	CH_2OCH_3	CHF_2	H	H	OH	0
4.177	CH_2Cl	CHF_2	H	H	OH	0
4.178	CH_2F	CHF_2	H	H	OH	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	P
4.179	CF_3	CHF_2	H	H	OH	1
4.18	CH_3	CHF_2	H	H	OH	1
4.181	CH_2OCH_3	CHF_2	H	H	OH	1
4.182	CH_2Cl	CHF_2	H	H	OH	1
4.183	CH_2F	CHF_2	H	H	OH	1
4.184	CH_3	CF_3	H	CH_3	OH	0
4.185	CH_3	CF_3	H	CH_3	OH	1
4.186	Cl	CF_3	H	CH_3	OH	0
4.187	CH_3	CF_3	CH_3	H	OH	0
4.188	CH_3	CF_3	Ph	H	OH	0
4.189	CH_3	CF_3	Cl	H	OH	0
4.19	CH_3	CF_3	$CO_2CH_2CH_3$	H	OH	0
4.191	CH_3	CF_3	CO_2CH_2Ph	H	OH	0
4.192	CH_3	CF_3	CH_3	H	OH	1
4.193	CH_3	CF_3	Ph	H	OH	1
4.194	CH_3	CF_3	Cl	H	OH	1
4.195	CH_3	CF_3	$CO_2CH_2CH_3$	H	OH	1
4.196	CH_3	CF_3	CO_2CH_2Ph	H	OH	1
4.197	OCH_3	CF_3	CH_3	H	OH	0
4.198	CH_2OCH_3	CF_3	CH_3	H	OH	0
4.199	CH_2OCH_3	CF_3	Ph	H	OH	0
4.2	CH_2OCH_3	CF_3	Cl	H	OH	0
4.201	CH_2OCH_3	CF_3	$CO_2CH_2CH_3$	H	OH	0
4.202	CH_2OCH_3	CF_3	CO_2CH_2Ph	H	OH	0
4.203	CH_2OCH_3	CF_3	CH_3	H	OH	1
4.204	CH_2OCH_3	CF_3	Ph	H	OH	1
4.205	CH_2OCH_3	CF_3	Cl	H	OH	1
4.206	CH_2OCH_3	CF_3	$CO_2CH_2CH_3$	H	OH	1
4.207	CH_2OCH_3	CF_3	CO_2CH_2Ph	H	OH	1
4.208	$COOCH_3$	H	H	H	OH	0
4.209	CF_3	SCH_3	H	H	OH	0

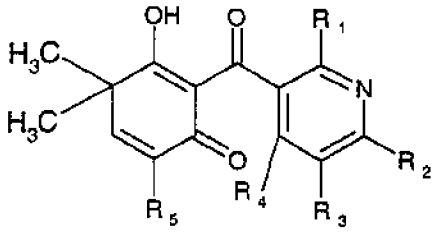
Comp. No.	R_1	R_2	R_3	R_4	R_5	P
4.21	CH_3	SCH_3	H	H	OH	0
4.211	CF_3	$SOCH_3$	H	H	OH	0
4.212	CH_3	$SOCH_3$	H	H	OH	0
4.213	CF_3	SO_2CH_3	H	H	OH	0
4.214	CH_3	SO_2CH_3	H	H	OH	0
4.215	CF_3	SCH_2CH_3	H	H	OH	0
4.216	CH_3	SCH_2CH_3	H	H	OH	0
4.217	CF_3	$SOCH_2CH_3$	H	H	OH	0
4.218	CH_3	$SOCH_2CH_3$	H	H	OH	0
4.219	CF_3	$SO_2CH_2CH_3$	H	H	OH	0
4.22	CH_3	$SO_2CH_2CH_3$	H	H	OH	0
4.221	CF_3	OCH_3	H	H	OH	0
4.222	CH_3	OCH_3	H	H	OH	0
4.223	CF_3	OCH_2CF_3	H	H	OH	0
4.224	CH_3	OCH_2CF_3	H	H	OH	0
4.225	CF_3	OCH_2CCH	H	H	OH	0
4.226	CH_3	OCH_2CCH	H	H	OH	0
4.227	CF_3	CN	H	H	OH	0
4.228	CH_3	CN	H	H	OH	0
4.229	CF_3	Cl	H	H	OH	0
4.23	CH_3	Cl	H	H	OH	0
4.231	H	Cl	H	H	OH	0
4.232	CF_3	OCH_3	H	H	OH	0
4.233	CH_3	OCH_3	H	H	OH	0
4.234	CF_3	CH_3	H	H	OH	0
4.235	H	CF_3	H	CH_3	OH	0
4.236	H	CF_3	H	CF_3	OH	0
4.237	H	CF_3	H	CH_2CH_3	OH	0
4.238	H	CF_3	H	CF_3	OH	0
4.239	H	CF_3	H	SCH_3	OH	0
4.24	H	CF_3	H	$SOCH_3$	OH	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	P
4.241	H	CF_3	H	SO_2CH_3	OH	0
4.242	H	CF_3	H	Cl	OH	0
4.243	H	CF_3	H	OCH_3	OH	0
4.244	H	CH_3	H	CF_3	OH	0
4.245	H	Cl	H	CF_3	OH	0
4.246	H	OCH_3	H	CF_3	OH	0
4.247	H	SCH_3	H	CF_3	OH	0
4.248	H	$SOCH_3$	H	CF_3	OH	0
4.249	CH_3	CF_3	H	H	$S(CH_2)_7CH_3$	0
4.25	CH_3	CF_3	H	H	$S(CH_2)_7CH_3$	0
4.251	CH_3	CF_3	H	H	$SO(CH_2)_7CH_3$	0
4.252	CH_3	CF_3	H	H	$SO_2(CH_2)_7CH_3$	0
4.253	CH_3	CF_3	H	H	SPh	0
4.254	CH_3	CF_3	H	H	SOPh	0
4.255	CH_3	CF_3	H	H	SO_2Ph	0
4.256	CH_3	CF_3	H	H	$NOCH_3$	0
4.257	CH_3	CF_3	H	H	$NOCH_2Ph$	0
4.258	CH_3	CF_3	H	H	$NOCH_2CH=CH_2$	0
4.259	CH_3	CF_3	H	H	$NOC(CH_3)_3$	0
4.26	CH_3	CF_3	H	H	$NOCH_2CH_3$	0
4.261	CH_3	CF_3	H	H	NCH_2CH_2SH	0
4.262	CH_3	CF_3	H	H	$NN(CH_3)_2$	0
4.263	CH_3	CF_3	H	H	$NN(CH_3)C(S)NH_2$	0
4.264	CH_3	CF_3	H	H	N-morpholino	0
4.265	CH_3	CF_3	H	H	$NHCOCH_3$	0
4.266	CH_3	CF_3	H	H	$NHCO(CH_2)_7CH_3$	0
4.267	CH_3	CF_3	H	H	NHCOPh	0
4.268	CH_3	CF_3	H	H	$NHSO_2CH_3$	0
4.269	CH_3	CF_3	H	H	$NH(CO)S(CH_2)_7CH_3$	0
4.27	CH_3	CF_3	H	H	Cl	0
4.271	CH_3	CF_3	H	H	NH_2	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	P
4.272	CH_3	CF_3	H	H	$OCOC(CH_3)_3$	0
4.273	CH_3	CF_3	H	H	$OCOCH_3$	0
4.274	CH_3	CF_3	H	H	OCOPh	0
4.275	CH_3	CF_3	H	H	OCO-cyclopropyl	0
4.276	CH_3	CF_3	H	H	$OCOCH_2CH_3$	0
4.277	CH_3	CF_3	H	H	$OCOCH=CH_2$	0
4.278	CH_3	CF_3	H	H	$OCOCH=CHCH_3$	0
4.279	CH_3	CF_3	H	H	$O(CO)SCH_3$	0
4.28	CH_3	CF_3	H	H	$O(CO)S(CH_2)_7CH_3$	0
4.281	CH_3	CF_3	H	H	$O(CO)OCH_2CH_3$	0
4.282	CH_3	CF_3	H	H	$O(CO)N(CH_2CH_3)_2$	0
4.283	CH_3	$(CF_2)_3CF_3$	H	H	OH	0
4.284	CH_3	CF_3	H	H	S-(4-Cl-phenyl)	0
4.285	CH_3	CF_3	H	H	SO-(4-Cl-phenyl)	0
4.286	CH_3	CF_3	H	H	SO_2-(4-Cl-phenyl)	0
4.287	CH_3	CF_3	H	H	S-(4-CF_3-phenyl)	0
4.288	CH_3	CF_3	H	H	SO-(4-CF_3-phenyl)	0
4.289	CH_3	CF_3	H	H	SO_2-(4-CF_3-phenyl)	0
4.29	CH_3	CF_3	H	H	S-(4-NO_2-phenyl)	0
4.291	CH_3	CF_3	H	H	SO-(4-NO_2-phenyl)	0
4.292	CH_3	CF_3	H	H	SO_2-(4-NO_2-phenyl)	0
4.293	CH_3	CF_3	H	H		0
4.294	CH_3	CF_3	H	H		0
4.295	CH_3	CF_3	H	H		0
4.296	CH_3	CF_3	H	H		0
4.297	CF_2H	SCH_3	H	H	OH	0

Comp. No.	R_1	R_2	R_3	R_4	R_5	P
4.298	CF_2Cl	SCH_3	H	H	OH	0
4.299	CF_2H	$SOCH_3$	H	H	OH	0
4.3	CF_2Cl	$SOCH_3$	H	H	OH	0
4.301	CF_2H	SO_2CH_3	H	H	OH	0
4.302	CF_2Cl	SO_2CH_3	H	H	OH	0
4.303	CF_2H	SCH_2CH_3	H	H	OH	0
4.304	CF_2Cl	SCH_2CH_3	H	H	OH	0
4.305	CF_2H	$SOCH_2CH_3$	H	H	OH	0
4.306	CF_2Cl	$SOCH_2CH_3$	H	H	OH	0
4.307	CF_2H	$SO_2CH_2CH_3$	H	H	OH	0
4.308	CF_2Cl	$SO_2CH_2CH_3$	H	H	OH	0
4.309	CF_2H	OCH_3	H	H	OH	0
4.31	CF_2Cl	OCH_3	H	H	OH	0
4.311	CF_2H	OCH_2CF_3	H	H	OH	0
4.312	CF_2Cl	OCH_2CF_3	H	H	OH	0
4.313	CF_2H	OCH_2CCH	H	H	OH	0
4.314	CF_2Cl	OCH_2CCH	H	H	OH	0
4.315	CF_2H	CN	H	H	OH	0
4.316	CF_2Cl	CN	H	H	OH	0
4.317	CF_2H	Cl	H	H	OH	0
4.318	CF_2Cl	Cl	H	H	OH	0
4.319	CF_2H	OCH_3	H	H	OH	0
4.32	CF_2Cl	OCH_3	H	H	OH	0
4.321	CF_3	CH_2OCH_3	H	H	OH	0
4.322	CF_3	CH_2OCH_3	H	H	OH	1
4.323	CF_2Cl	CH_2OCH_3	H	H	OH	0
4.324	CF_2Cl	CH_2OCH_3	H	H	OH	1
4.325	CF_2H	CH_2OCH_3	H	H	OH	0
4.326	CF_2H	CH_2OCH_3	H	H	OH	1
4.327	CN	CF_3	H	H	OH	0
4.328	SCH_3	H	H	H	OH	0

Table 5

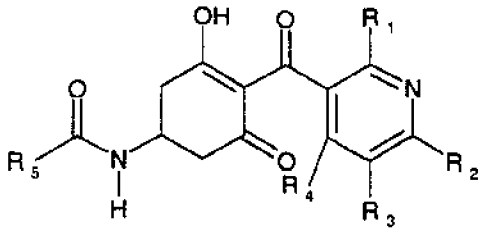


Comp. No.	R_1	R_2	R_3	R_4	R_5
5.001	H	CF_3	H	H	CH_3
5.002	F	CF_3	H	H	CH_3
5.003	Cl	CF_3	H	H	CH_3
5.004	CHF_2	CF_3	H	H	CH_3
5.005	CCl_3	CF_3	H	H	CH_3
5.006	$CClF_2$	CF_3	H	H	CH_3
5.007	CF_3	CF_3	H	H	CH_3
5.008	CH_3	CF_3	H	H	CH_3
5.009	CH_2CH_3	CF_3	H	H	CH_3
5.01	$CH(CH_3)_2$	CF_3	H	H	CH_3
5.011	$(CH_2)_2CH_3$	CF_3	H	H	CH_3
5.012	CH_2F	CF_3	H	H	CH_3
5.013	CH_2Cl	CF_3	H	H	CH_3
5.014	CH_2Br	CF_3	H	H	CH_3
5.015	CH_2OCOCH_3	CF_3	H	H	CH_3
5.016	CH_2OCH_3	CF_3	H	H	CH_3
5.017	$CH_2CH_2OCH_3$	CF_3	H	H	CH_3
5.018	CH_2SMe	CF_3	H	H	CH_3
5.019	CH_2SOMe	CF_3	H	H	CH_3
5.02	CH_2SO_2Me	CF_3	H	H	CH_3
5.021	$N(CH_3)_2$	CF_3	H	H	CH_3
5.022	$CH=CH_2$	CF_3	H	H	CH_3
5.023	$CH_2CH=CH_2$	CF_3	H	H	CH_3
5.024	$SO_2N(CH_3)_2$	CF_3	H	H	CH_3

Comp. No.	R_1	R_2	R_3	R_4	R_5
5.025	CCH	CF_3	H	H	CH_3
5.026	cyclopropyl	CF_3	H	H	CH_3
5.027	OCH_3	CF_3	H	H	CH_3
5.028	OPh	CF_3	H	H	CH_3
5.029	$OCHF_2$	CF_3	H	H	CH_3
5.03	CO_2Me	CF_3	H	H	CH_3
5.031	OCH_2CCH	CF_3	H	H	CH_3
5.032	CF_3	SCH_3	H	H	CH_3
5.033	CH_3	SCH_3	H	H	CH_3
5.034	CF_3	$SOCH_3$	H	H	CH_3
5.035	CH_3	$SOCH_3$	H	H	CH_3
5.036	CF_3	SO_2CH_3	H	H	CH_3
5.037	CH_3	SO_2CH_3	H	H	CH_3
5.038	CF_3	OCH_3	H	H	CH_3
5.039	CH_3	OCH_3	H	H	CH_3
5.04	CF_3	OCH_2CF_3	H	H	CH_3
5.041	CH_3	OCH_2CF_3	H	H	CH_3
5.042	CF_3	OCH_2CCH	H	H	CH_3
5.043	CH_3	OCH_2CCH	H	H	CH_3
5.044	CF_3	CN	H	H	CH_3
5.045	CH_3	CN	H	H	CH_3
5.046	CF_3	Cl	H	H	CH_3
5.047	CH_3	Cl	H	H	CH_3
5.048	H	Cl	H	H	CH_3
5.049	CF_3	OCH_3	H	H	CH_3
5.05	CH_3	OCH_3	H	H	CH_3
5.051	CF_3	CH_3	H	H	CH_3
5.052	H	CF_3	H	CH_3	CH_3
5.053	H	CF_3	H	CF_3	CH_3
5.054	H	CF_3	H	CH_2CH_3	CH_3
5.055	H	CF_3	H	CF_3	CH_3
5.056	H	CF_3	H	SCH_3	CH_3

Comp. No.	R_1	R_2	R_3	R_4	R_5
5.057	H	CF_3	H	$SOCH_3$	CH_3
5.058	H	CF_3	H	SO_2CH_3	CH_3
5.059	H	CF_3	H	Cl	CH_3
5.06	H	CF_3	H	OCH_3	CH_3
5.061	H	CH_3	H	CF_3	CH_3
5.062	H	Cl	H	CF_3	CH_3
5.063	H	OCH_3	H	CF_3	CH_3
5.064	H	SCH_3	H	CF_3	CH_3
5.065	H	$SOCH_3$	H	CF_3	CH_3
5.066	CF_2Cl	CH_3	H	H	CH_3
5.067	CF_2Cl	CH_2CH_3	H	H	CH_3
5.068	CF_2Cl	SCH_3	H	H	CH_3
5.069	CF_2Cl	$SOCH_3$	H	H	CH_3
5.07	CF_2Cl	SO_2CH_3	H	H	CH_3
5.071	CF_2Cl	OCH_3	H	H	CH_3
5.072	CF_2Cl	OCH_2CF_3	H	H	CH_3
5.073	CF_2Cl	OCH_2CCH	H	H	CH_3
5.074	CF_2Cl	CN	H	H	CH_3
5.075	CF_2Cl	Cl	H	H	CH_3
5.076	CF_2Cl	OCH_3	H	H	CH_3
5.077	CF_3	CH_2OCH_3	H	H	CH_3
5.078	CF_2Cl	CH_2OCH_3	H	H	CH_3
5.079	CF_2H	CH_2OCH_3	H	H	CH_3
5.08	CN	CF_3	H	H	CH_3
5.081	CH_3	CF_3	H	H	CH_2CH_3
5.082	CH_3	CF_3	H	H	SCH_3
5.083	CH_3	CF_3	H	H	$SOCH_3$
5.084	CH_3	CF_3	H	H	SO_2CH_3
5.085	CH_3	CF_3	H	H	H

Table 6:



Comp. No.	R_1	R_2	R_3	R_4	R_5
6.001	Cl	CF_3	H	H	CH_2CH_3
6.002	CHF_2	CF_3	H	H	CH_2CH_3
6.003	CCl_3	CF_3	H	H	CH_2CH_3
6.004	$CClF_2$	CF_3	H	H	CH_2CH_3
6.005	CF_3	CF_3	H	H	CH_2CH_3
6.006	CH_3	CF_3	H	H	CH_2CH_3
6.007	CH_2CH_3	CF_3	H	H	CH_2CH_3
6.008	$(CH_2)_2CH_3$	CF_3	H	H	CH_2CH_3
6.009	CH_2F	CF_3	H	H	CH_2CH_3
6.01	CH_2Cl	CF_3	H	H	CH_2CH_3
6.011	CH_2OCH_3	CF_3	H	H	CH_2CH_3
6.012	CH_2SMe	CF_3	H	H	CH_2CH_3
6.013	CH_2SO_2Me	CF_3	H	H	CH_2CH_3
6.014	$CH=CH_2$	CF_3	H	H	CH_2CH_3
6.015	$CH_2CH=CH_2$	CF_3	H	H	CH_2CH_3
6.016	CCH	CF_3	H	H	CH_2CH_3
6.017	CF_3	SCH_3	H	H	CH_2CH_3
6.018	CF_3	$SOCH_3$	H	H	CH_2CH_3
6.019	CF_3	SO_2CH_3	H	H	CH_2CH_3
6.02	CF_3	OCH_3	H	H	CH_2CH_3
6.021	CF_3	CN	H	H	CH_2CH_3
6.022	CF_3	Cl	H	H	CH_2CH_3
6.023	CF_3	OCH_3	H	H	CH_2CH_3
6.024	CF_3	CH_3	H	H	CH_2CH_3

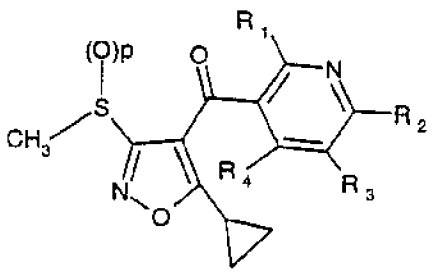
Comp. No.	R_1	R_2	R_3	R_4	R_5
6.025	H	CF_3	H	CH_3	CH_2CH_3
6.026	H	CF_3	H	CF_3	CH_2CH_3
6.027	H	CF_3	H	SCH_3	CH_2CH_3
6.028	H	CF_3	H	$SOCH_3$	CH_2CH_3
6.029	H	CF_3	H	SO_2CH_3	CH_2CH_3
6.03	H	CF_3	H	Cl	CH_2CH_3
6.031	H	CF_3	H	OCH_3	CH_2CH_3
6.032	H	CH_3	H	CF_3	CH_2CH_3
6.033	H	Cl	H	CF_3	CH_2CH_3
6.034	H	OCH_3	H	CF_3	CH_2CH_3
6.035	CN	CF_3	H	H	CH_2CH_3
6.036	Cl	CF_3	H	H	$CH(CH_3)_2$
6.037	CHF_2	CF_3	H	H	$CH(CH_3)_2$
6.038	CCl_3	CF_3	H	H	$CH(CH_3)_2$
6.039	$CClF_2$	CF_3	H	H	$CH(CH_3)_2$
6.04	CF_3	CF_3	H	H	$CH(CH_3)_2$
6.041	CH_3	CF_3	H	H	$CH(CH_3)_2$
6.042	CH_2CH_3	CF_3	H	H	$CH(CH_3)_2$
6.043	$(CH_2)_2CH_3$	CF_3	H	H	$CH(CH_3)_2$
6.044	CH_2F	CF_3	H	H	$CH(CH_3)_2$
6.045	CH_2Cl	CF_3	H	H	$CH(CH_3)_2$
6.046	CH_2OCH_3	CF_3	H	H	$CH(CH_3)_2$
6.047	CH_2SMe	CF_3	H	H	$CH(CH_3)_2$
6.048	CH_2SO_2Me	CF_3	H	H	$CH(CH_3)_2$
6.049	$CH=CH_2$	CF_3	H	H	$CH(CH_3)_2$
6.05	$CH_2CH=CH_2$	CF_3	H	H	$CH(CH_3)_2$
6.051	CCH	CF_3	H	H	$CH(CH_3)_2$
6.052	CF_3	SCH_3	H	H	$CH(CH_3)_2$
6.053	CF_3	$SOCH_3$	H	H	$CH(CH_3)_2$
6.054	CF_3	SO_2CH_3	H	H	$CH(CH_3)_2$
6.055	CF_3	OCH_3	H	H	$CH(CH_3)_2$
6.056	CF_3	CN	H	H	$CH(CH_3)_2$

Comp. No.	R_1	R_2	R_3	R_4	R_5
6.057	CF_3	Cl	H	H	$CH(CH_3)_2$
6.058	CF_3	OCH_3	H	H	$CH(CH_3)_2$
6.059	CF_3	CH_3	H	H	$CH(CH_3)_2$
6.06	H	CF_3	H	CH_3	$CH(CH_3)_2$
6.061	H	CF_3	H	CF_3	$CH(CH_3)_2$
6.062	H	CF_3	H	SCH_3	$CH(CH_3)_2$
6.063	H	CF_3	H	$SOCH_3$	$CH(CH_3)_2$
6.064	H	CF_3	H	SO_2CH_3	$CH(CH_3)_2$
6.065	H	CF_3	H	Cl	$CH(CH_3)_2$
6.066	H	CF_3	H	OCH_3	$CH(CH_3)_2$
6.067	H	CH_3	H	CF_3	$CH(CH_3)_2$
6.068	H	Cl	H	CF_3	$CH(CH_3)_2$
6.069	H	OCH_3	H	CF_3	$CH(CH_3)_2$
6.07	CN	CF_3	H	H	$CH(CH_3)_2$
6.071	Cl	CF_3	H	H	HNPh
6.072	CHF_2	CF_3	H	H	HNPh
6.073	CCl_3	CF_3	H	H	HNPh
6.074	$CClF_2$	CF_3	H	H	HNPh
6.075	CF_3	CF_3	H	H	HNPh
6.076	CH_3	CF_3	H	H	HNPh
6.077	CH_2CH_3	CF_3	H	H	HNPh
6.078	$(CH_2)_2CH_3$	CF_3	H	H	HNPh
6.079	CH_2F	CF_3	H	H	HNPh
6.08	CH_2Cl	CF_3	H	H	HNPh
6.081	CH_2OCH_3	CF_3	H	H	HNPh
6.082	CH_2SMe	CF_3	H	H	HNPh
6.083	CH_2SO_2Me	CF_3	H	H	HNPh
6.084	$CH=CH_2$	CF_3	H	H	HNPh
6.085	$CH_2CH=CH_2$	CF_3	H	H	HNPh
6.086	CCH	CF_3	H	H	HNPh
6.087	CF_3	SCH_3	H	H	HNPh
6.088	CF_3	$SOCH_3$	H	H	HNPh

Comp. No.	R_1	R_2	R_3	R_4	R_5
6.089	CF_3	SO_2CH_3	H	H	HNPh
6.09	CF_3	OCH_3	H	H	HNPh
6.091	CF_3	CN	H	H	HNPh
6.092	CF_3	Cl	H	H	HNPh
6.093	CF_3	OCH_3	H	H	HNPh
6.094	CF_3	CH_3	H	H	HNPh
6.095	H	CF_3	H	CH_3	HNPh
6.096	H	CF_3	H	CF_3	HNPh
6.097	H	CF_3	H	SCH_3	HNPh
6.098	H	CF_3	H	$SOCH_3$	HNPh
6.099	H	CF_3	H	SO_2CH_3	HNPh
6.1	H	CF_3	H	Cl	HNPh
6.101	H	CF_3	H	OCH_3	HNPh
6.102	H	CH_3	H	CF_3	HNPh
6.103	H	Cl	H	CF_3	HNPh
6.104	H	OCH_3	H	CF_3	HNPh
6.105	CN	CF_3	H	H	HNPh
6.106	Cl	CF_3	H	H	$HNC(CH_3)_3$
6.107	CHF_2	CF_3	H	H	$HNC(CH_3)_3$
6.108	CCl_3	CF_3	H	H	$HNC(CH_3)_3$
6.109	$CClF_2$	CF_3	H	H	$HNC(CH_3)_3$
6.11	CF_3	CF_3	H	H	$HNC(CH_3)_3$
6.111	CH_3	CF_3	H	H	$HNC(CH_3)_3$
6.112	CH_2CH_3	CF_3	H	H	$HNC(CH_3)_3$
6.113	$(CH_2)_2CH_3$	CF_3	H	H	$HNC(CH_3)_3$
6.114	CH_2F	CF_3	H	H	$HNC(CH_3)_3$
6.115	CH_2Cl	CF_3	H	H	$HNC(CH_3)_3$
6.116	CH_2OCH_3	CF_3	H	H	$HNC(CH_3)_3$
6.117	CH_2SMe	CF_3	H	H	$HNC(CH_3)_3$
6.118	CH_2SO_2Me	CF_3	H	H	$HNC(CH_3)_3$
6.119	$CH=CH_2$	CF_3	H	H	$HNC(CH_3)_3$
6.12	$CH_2CH=CH_2$	CF_3	H	H	$HNC(CH_3)_3$

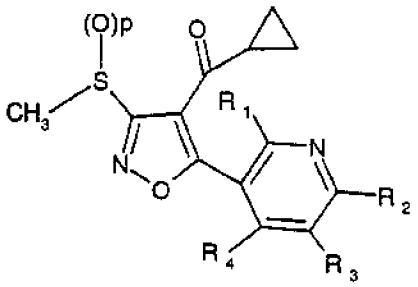
Comp. No.	R_1	R_2	R_3	R_4	R_5
6.121	CCH	CF_3	H	H	$HNC(CH_3)_3$
6.122	CF_3	SCH_3	H	H	$HNC(CH_3)_3$
6.123	CF_3	$SOCH_3$	H	H	$HNC(CH_3)_3$
6.124	CF_3	SO_2CH_3	H	H	$HNC(CH_3)_3$
6.125	CF_3	OCH_3	H	H	$HNC(CH_3)_3$
6.126	CF_3	CN	H	H	$HNC(CH_3)_3$
6.127	CF_3	Cl	H	H	$HNC(CH_3)_3$
6.128	CF_3	OCH_3	H	H	$HNC(CH_3)_3$
6.129	CF_3	CH_3	H	H	$HNC(CH_3)_3$
6.13	H	CF_3	H	CH_3	$HNC(CH_3)_3$
6.131	H	CF_3	H	CF_3	$HNC(CH_3)_3$
6.132	H	CF_3	H	SCH_3	$HNC(CH_3)_3$
6.133	H	CF_3	H	$SOCH_3$	$HNC(CH_3)_3$
6.134	H	CF_3	H	SO_2CH_3	$HNC(CH_3)_3$
6.135	H	CF_3	H	Cl	$HNC(CH_3)_3$
6.136	H	CF_3	H	OCH_3	$HNC(CH_3)_3$
6.137	H	CH_3	H	CF_3	$HNC(CH_3)_3$
6.138	H	Cl	H	CF_3	$HNC(CH_3)_3$
6.139	H	OCH_3	H	CF_3	$HNC(CH_3)_3$
6.14	CN	CF_3	H	H	$HNC(CH_3)_3$

Table 7:



A

and



B

Comp. No.	R_1	R_2	R_3	R_4	p
7.001	H	CF_3	H	H	0
7.002	F	CF_3	H	H	0
7.003	Cl	CF_3	H	H	0
7.004	Br	CF_3	H	H	0
7.005	CHF_2	CF_3	H	H	0
7.006	CCl_3	CF_3	H	H	0
7.007	$CClF_2$	CF_3	H	H	0
7.008	CF_3	CF_3	H	H	0
7.009	CH_3	CF_3	H	H	0
7.01	CH_2CH_3	CF_3	H	H	0
7.011	$CH(CH_3)_2$	CF_3	H	H	0
7.012	$(CH_2)_2CH_3$	CF_3	H	H	0
7.013	$C(CH_3)_3$	CF_3	H	H	0
7.014	Ph	CF_3	H	H	0
7.015	CH_2F	CF_3	H	H	0
7.016	CH_2Cl	CF_3	H	H	0
7.017	CH_2Br	CF_3	H	H	0
7.018	CH_2OH	CF_3	H	H	0
7.019	CH_2OCOCH_3	CF_3	H	H	0
7.02	CH_2OCOPh	CF_3	H	H	0
7.021	CH_2OCH_3	CF_3	H	H	0
7.022	$CH_2OCH_2CH_3$	CF_3	H	H	0

Comp. No.	R_1	R_2	R_3	R_4	p
7.023	$CH_2CH_2OCH_3$	CF_3	H	H	0
7.024	CH_2SMe	CF_3	H	H	0
7.025	CH_2SOMe	CF_3	H	H	0
7.026	CH_2SO_2Me	CF_3	H	H	0
7.027	CH_2SO_2Ph	CF_3	H	H	0
7.028	SCH_3	CF_3	H	H	0
7.029	$SOCH_3$	CF_3	H	H	0
7.03	SO_2CH_3	CF_3	H	H	0
7.031	$N(CH_3)_2$	CF_3	H	H	0
7.032	$CH=CH_2$	CF_3	H	H	0
7.033	$CH_2CH=CH_2$	CF_3	H	H	0
7.034	$SO_2N(CH_3)_2$	CF_3	H	H	0
7.035	CCH	CF_3	H	H	0
7.036	cyclopropyl	CF_3	H	H	0
7.037	OCH_3	CF_3	H	H	0
7.038	$OCHF_2$	CF_3	H	H	0
7.039	OCH_2CCH	CF_3	H	H	0
7.04	H	CF_2CF_3	H	H	0
7.041	Cl	CF_2CF_3	H	H	0
7.042	CHF_2	CF_2CF_3	H	H	0
7.043	CCl_3	CF_2CF_3	H	H	0
7.044	$CClF_2$	CF_2CF_3	H	H	0
7.045	CF_3	CF_2CF_3	H	H	0
7.046	CH_3	CF_2CF_3	H	H	0
7.047	CH_2CH_3	CF_2CF_3	H	H	0
7.048	$CH(CH_3)_2$	CF_2CF_3	H	H	0
7.049	$(CH_2)_2CH_3$	CF_2CF_3	H	H	0
7.05	$C(CH_3)_3$	CF_2CF_3	H	H	0
7.051	CH_2F	CF_2CF_3	H	H	0
7.052	CH_2Cl	CF_2CF_3	H	H	0
7.053	CH_2OH	CF_2CF_3	H	H	0
7.054	CH_2OCOCH_3	CF_2CF_3	H	H	0

Comp. No.	R_1	R_2	R_3	R_4	p
7.055	CH_2OCOPh	CF_2CF_3	H	H	0
7.056	CH_2OCH_3	CF_2CF_3	H	H	0
7.057	$CH_2OCH_2CH_3$	CF_2CF_3	H	H	0
7.058	CH_2SMe	CF_2CF_3	H	H	0
7.059	CH_2SOMe	CF_2CF_3	H	H	0
7.06	CH_2SO_2Me	CF_2CF_3	H	H	0
7.061	CH_2SO_2Ph	CF_2CF_3	H	H	0
7.062	$N(CH_3)_2$	CF_2CF_3	H	H	0
7.063	$CH=CH_2$	CF_2CF_3	H	H	0
7.064	$CH_2CH=CH_2$	CF_2CF_3	H	H	0
7.065	$SO_2N(CH_3)_2$	CF_2CF_3	H	H	0
7.066	CCH	CF_2CF_3	H	H	0
7.067	cyclopropyl	CF_2CF_3	H	H	0
7.068	OCH_3	CF_2CF_3	H	H	0
7.069	CO_2Me	CF_2CF_3	H	H	0
7.07	OCH_2CCH	CF_2CF_3	H	H	0
7.071	H	CF_2Cl	H	H	0
7.072	Cl	CF_2Cl	H	H	0
7.073	CHF_2	CF_2Cl	H	H	0
7.074	CCl_3	CF_2Cl	H	H	0
7.075	$CClF_2$	CF_2Cl	H	H	0
7.076	CF_3	CF_2Cl	H	H	0
7.077	CH_3	CF_2Cl	H	H	0
7.078	CH_2CH_3	CF_2Cl	H	H	0
7.079	$CH(CH_3)_2$	CF_2Cl	H	H	0
7.08	$(CH_2)_2CH_3$	CF_2Cl	H	H	0
7.081	$C(CH_3)_3$	CF_2Cl	H	H	0
7.082	CH_2F	CF_2Cl	H	H	0
7.083	CH_2Cl	CF_2Cl	H	H	0
7.084	CH_2OH	CF_2Cl	H	H	0
7.085	CH_2OCOCH_3	CF_2Cl	H	H	0
7.086	CH_2OCOPh	CF_2Cl	H	H	0

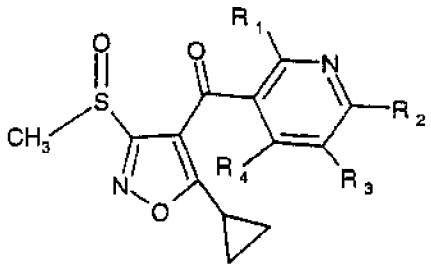
Comp. No.	R_1	R_2	R_3	R_4	p
7.087	CH_2OCH_3	CF_2Cl	H	H	0
7.088	$CH_2OCH_2CH_3$	CF_2Cl	H	H	0
7.089	CH_2SMe	CF_2Cl	H	H	0
7.09	CH_2SOMe	CF_2Cl	H	H	0
7.091	CH_2SO_2Me	CF_2Cl	H	H	0
7.092	CH_2SO_2Ph	CF_2Cl	H	H	0
7.093	$N(CH_3)_2$	CF_2Cl	H	H	0
7.094	$CH=CH_2$	CF_2Cl	H	H	0
7.095	$CH_2CH=CH_2$	CF_2Cl	H	H	0
7.096	$SO_2N(CH_3)_2$	CF_2Cl	H	H	0
7.097	CCH	CF_2Cl	H	H	0
7.098	cyclopropyl	CF_2Cl	H	H	0
7.099	OCH_3	CF_2Cl	H	H	0
7.1	OCH_2CCH	CF_2Cl	H	H	0
7.101	CF_3	CHF_2	H	H	0
7.102	CH_3	CHF_2	H	H	0
7.103	CH_2OCH_3	CHF_2	H	H	0
7.104	CH_2Cl	CHF_2	H	H	0
7.105	CH_2F	CHF_2	H	H	0
7.106	CH_3	CF_3	H	CH_3	0
7.107	Cl	CF_3	H	CH_3	0
7.108	CH_3	CF_3	CH_3	H	0
7.109	CH_3	CF_3	Cl	H	0
7.11	OCH_3	CF_3	CH_3	H	0
7.111	CH_2OCH_3	CF_3	CH_3	H	0
7.112	CH_2OCH_3	CF_3	Cl	H	0
7.113	$COOCH_3$	H	H	H	0
7.114	CF_3	SCH_3	H	H	0
7.115	CH_3	SCH_3	H	H	0
7.116	CF_3	$SOCH_3$	H	H	0
7.117	CH_3	$SOCH_3$	H	H	0
7.118	CF_3	SO_2CH_3	H	H	0

Comp. No.	R_1	R_2	R_3	R_4	p
7.119	CH_3	SO_2CH_3	H	H	0
7.12	CF_3	OCH_3	H	H	0
7.121	CH_3	OCH_3	H	H	0
7.122	CF_3	OCH_2CF_3	H	H	0
7.123	CH_3	OCH_2CF_3	H	H	0
7.124	CF_3	OCH_2CCH	H	H	0
7.125	CH_3	OCH_2CCH	H	H	0
7.126	CF_3	CN	H	H	0
7.127	CH_3	CN	H	H	0
7.128	CF_3	Cl	H	H	0
7.129	CF_3	Cl	H	H	0
7.13	CH_3	Cl	H	H	0
7.131	H	Cl	H	H	0
7.132	CF_3	OCH_3	H	H	0
7.133	CH_3	OCH_3	H	H	0
7.134	CF_3	CH_3	H	H	0
7.135	H	CF_3	H	CH_3	0
7.136	H	CF_3	H	CF_3	0
7.137	H	CF_3	H	CH_2CH_3	0
7.138	H	CF_3	H	CF_3	0
7.139	H	CF_3	H	SCH_3	0
7.14	H	CF_3	H	$SOCH_3$	0
7.141	H	CF_3	H	SO_2CH_3	0
7.142	H	CF_3	H	Cl	0
7.143	H	CF_3	H	OCH_3	0
7.144	H	CH_3	H	CF_3	0
7.145	H	Cl	H	CF_3	0
7.146	H	OCH_3	H	CF_3	0
7.147	H	SCH_3	H	CF_3	0
7.148	H	$SOCH_3$	H	CF_3	0
7.149	CH_3	$(CF_2)_3CF_3$	H	H	0
7.15	CF_2H	SCH_3	H	H	0

Comp. No.	R_1	R_2	R_3	R_4	p
7.151	CF_2Cl	SCH_3	H	H	0
7.152	CF_2H	$SOCH_3$	H	H	0
7.153	CF_2Cl	$SOCH_3$	H	H	0
7.154	CF_2H	SO_2CH_3	H	H	0
7.155	CF_2Cl	SO_2CH_3	H	H	0
7.156	CF_2H	OCH_3	H	H	0
7.157	CF_2Cl	OCH_3	H	H	0
7.158	CF_2H	OCH_2CF_3	H	H	0
7.159	CF_2Cl	OCH_2CF_3	H	H	0
7.16	CF_2H	OCH_2CCH	H	H	0
7.161	CF_2Cl	OCH_2CCH	H	H	0
7.162	CF_2H	CN	H	H	0
7.163	CF_2Cl	CN	H	H	0
7.164	CF_2H	Cl	H	H	0
7.165	CF_2Cl	Cl	H	H	0
7.166	CF_2H	OCH_3	H	H	0
7.167	CF_2Cl	OCH_3	H	H	0
7.168	CF_3	CH_2OCH_3	H	H	0
7.169	CF_2Cl	CH_2OCH_3	H	H	0
7.17	CF_2H	CH_2OCH_3	H	H	0
7.171	CN	CF_3	H	H	0
7.172	H	CF_3	H	H	2
7.173	F	CF_3	H	H	2
7.174	Cl	CF_3	H	H	2
7.175	Br	CF_3	H	H	2
7.176	CHF_2	CF_3	H	H	2
7.177	CCl_3	CF_3	H	H	2
7.178	$CClF_2$	CF_3	H	H	2
7.179	CF_3	CF_3	H	H	2
7.18	CH_3	CF_3	H	H	2
7.181	CH_2CH_3	CF_3	H	H	2
7.182	$CH(CH_3)_2$	CF_3	H	H	2

Comp. No.	R_1	R_2	R_3	R_4	p
7.183	$(CH_2)_2CH_3$	CF_3	H	H	2
7.184	$C(CH_3)_3$	CF_3	H	H	2
7.185	Ph	CF_3	H	H	2
7.186	CH_2F	CF_3	H	H	2
7.187	CH_2Cl	CF_3	H	H	2
7.188	CH_2Br	CF_3	H	H	2
7.189	CH_2OH	CF_3	H	H	2
7.19	CH_2OCOCH_3	CF_3	H	H	2
7.191	CH_2OCOPh	CF_3	H	H	2
7.192	CH_2OCH_3	CF_3	H	H	2
7.193	$CH_2OCH_2CH_3$	CF_3	H	H	2
7.194	$CH_2CH_2OCH_3$	CF_3	H	H	2
7.195	CH_2SMe	CF_3	H	H	2
7.196	CH_2SOMe	CF_3	H	H	2
7.197	CH_2SO_2Me	CF_3	H	H	2
7.198	CH_2SO_2Ph	CF_3	H	H	2
7.199	SCH_3	CF_3	H	H	2
7.2	$SOCH_3$	CF_3	H	H	2
7.201	SO_2CH_3	CF_3	H	H	2
7.202	$N(CH_3)_2$	CF_3	H	H	2
7.203	$CH=CH_2$	CF_3	H	H	2
7.204	$CH_2CH=CH_2$	CF_3	H	H	2
7.205	$SO_2N(CH_3)_2$	CF_3	H	H	2
7.206	CCH	CF_3	H	H	2
7.207	cyclopropyl	CF_3	H	H	2
7.208	OCH_3	CF_3	H	H	2
7.209	$OCHF_2$	CF_3	H	H	2
7.21	OCH_2CCH	CF_3	H	H	2

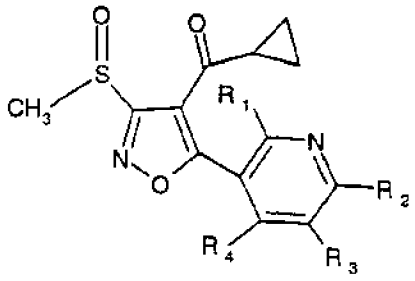
Table 8



Comp. No.	R_1	R_2	R_3	R_4
8.001	H	CF_3	H	H
8.002	F	CF_3	H	H
8.003	Cl	CF_3	H	H
8.004	Br	CF_3	H	H
8.005	CHF_2	CF_3	H	H
8.006	CCl_3	CF_3	H	H
8.007	$CClF_2$	CF_3	H	H
8.008	CF_3	CF_3	H	H
8.009	CH_3	CF_3	H	H
8.01	CH_2CH_3	CF_3	H	H
8.011	$CH(CH_3)_2$	CF_3	H	H
8.012	$(CH_2)_2CH_3$	CF_3	H	H
8.013	$C(CH_3)_3$	CF_3	H	H
8.014	Ph	CF_3	H	H
8.015	CH_2F	CF_3	H	H
8.016	CH_2Cl	CF_3	H	H
8.017	CH_2Br	CF_3	H	H
8.018	CH_2OH	CF_3	H	H
8.019	CH_2OCOCH_3	CF_3	H	H
8.02	CH_2OCOPh	CF_3	H	H
8.021	CH_2OCH_3	CF_3	H	H
8.022	$CH_2OCH_2CH_3$	CF_3	H	H
8.023	$CH_2CH_2OCH_3$	CF_3	H	H
8.024	CH_2SMe	CF_3	H	H

Comp. No.	R_1	R_2	R_3	R_4
8.025	CH_2SOMe	CF_3	H	H
8.026	CH_2SO_2Me	CF_3	H	H
8.027	CH_2SO_2Ph	CF_3	H	H
8.028	SCH_3	CF_3	H	H
8.029	$SOCH_3$	CF_3	H	H
8.03	SO_2CH_3	CF_3	H	H
8.031	$N(CH_3)_2$	CF_3	H	H
8.032	$CH=CH_2$	CF_3	H	H
8.033	$CH_2CH=CH_2$	CF_3	H	H
8.034	$SO_2N(CH_3)_2$	CF_3	H	H
8.035	CCH	CF_3	H	H
8.036	cyclopropyl	CF_3	H	H
8.037	OCH_3	CF_3	H	H
8.038	$OCHF_2$	CF_3	H	H
8.039	OCH_2CCH	CF_3	H	H

Table 9:



Comp. No.	R_1	R_2	R_3	R_4
9.001	H	CF_3	H	H
9.002	F	CF_3	H	H
9.003	Cl	CF_3	H	H
9.004	Br	CF_3	H	H
9.005	CHF_2	CF_3	H	H
9.006	CCl_3	CF_3	H	H

Comp. No.	R_1	R_2	R_3	R_4
9.007	$CClF_2$	CF_3	H	H
9.008	CF_3	CF_3	H	H
9.009	CH_3	CF_3	H	H
9.01	CH_2CH_3	CF_3	H	H
9.011	$CH(CH_3)_2$	CF_3	H	H
9.012	$(CH_2)_2CH_3$	CF_3	H	H
9.013	$C(CH_3)_3$	CF_3	H	H
9.014	Ph	CF_3	H	H
9.015	CH_2F	CF_3	H	H
9.016	CH_2Cl	CF_3	H	H
9.017	CH_2Br	CF_3	H	H
9.018	CH_2OH	CF_3	H	H
9.019	CH_2OCOCH_3	CF_3	H	H
9.02	CH_2OCOPh	CF_3	H	H
9.021	CH_2OCH_3	CF_3	H	H
9.022	$CH_2OCH_2CH_3$	CF_3	H	H
9.023	$CH_2CH_2OCH_3$	CF_3	H	H
9.024	CH_2SMe	CF_3	H	H
9.025	CH_2SOMe	CF_3	H	H
9.026	CH_2SO_2Me	CF_3	H	H
9.027	CH_2SO_2Ph	CF_3	H	H
9.028	SCH_3	CF_3	H	H
9.029	$SOCH_3$	CF_3	H	H
9.03	SO_2CH_3	CF_3	H	H
9.031	$N(CH_3)_2$	CF_3	H	H
9.032	$CH=CH_2$	CF_3	H	H
9.033	$CH_2CH=CH_2$	CF_3	H	H
9.034	$SO_2N(CH_3)_2$	CF_3	H	H
9.035	CCH	CF_3	H	H
9.036	cyclopropyl	CF_3	H	H
9.037	OCH_3	CF_3	H	H
9.038	$OCHF_2$	CF_3	H	H

Comp. No.	R_1	R_2	R_3	R_4
9.039	OCH_2CCH	CF_3	H	H

Physical data (melting points in°C):

Comp. No.	
1.001	resin
1.005	crystals m.p. 61-62
1.008	oil
1.009	crystals m.p. 75-77
1.01	oil
1.011	crystals m.p. 111-112
1.012	crystals m.p. 87-88
1.013	crystals m.p. 112-114
1.014	oil
1.021	crystals m.p. 128-129
1.023	crystals m.p. 91-92
1.024	oil
1.026	amorphous
1.028	amorphous
1.03	resin
1.031	crystals m.p. 145-146
1.042	oil
1.043	crystals m.p. 107-110
1.047	crystals m.p. 155-156
1.048	viscous
1.05	crystals m.p. 51-53
1.06	crystals m.p. >220
1.109	oil
1.195	oil
1.258	crystals m.p. 119-121

1.31	crystals m.p. 92-94
1.312	viscous
1.313	crystals m.p. 137-138
1.314	oil
1.316	resin
1.323	oil
1.334	resin
1.335	crystals m.p. 140-142
1.339	crystals m.p. 137-139
1.341	resin
1.343	crystals m.p. 97-99
1.347	crystals m.p. 135-137
1.349	oil, n_D 1.4965
1.351	crystals m.p. 125-127
1.353	resin, n_D 1.5289
1.355	crystals m.p. 90-92
1.356	resin
1.358	resin
1.361	oil
1.362	crystals m.p. 139-142
1.371	crystals m.p. 96-97
1.372	resin
1.373	resin
1.374	crystals m.p. 116-1199
1.375	resin
1.376	crystals m.p. >270
1.381	crystals m.p. 117-118
1.383	crystals m.p. 172-173
1.384	resin
1.385	resin
1.386	resin
1.387	resin
1.388	crystals m.p. 102-104

1.389	crystals m.p. 143-145
1.39	crystals m.p. 195-197
1.391	solid
1.392	crystals m.p. 202-206
1.398	crystals m.p. 137-138
1.399	crystals m.p. 262-263
1.4	oil
1.401	oil
1.402	oil
1.403	oil
1.404	oil
1.405	viscous
1.406	oil
1.408	oil
1.409	oil
1.41	oil
1.411	crystals m.p. 98-100
1.412	crystals m.p. 130-131
1.413	crystals m.p. 167-170
1.414	crystals m.p. 166-167
1.415	crystals m.p. 91-93
1.418	crystals m.p. 149-150
1.421	crystals m.p. 88-89
1.422	crystals m.p. 175-177
1.423	crystals m.p. 45-47
1.424	crystals m.p. 102-104
2.001	resin
2.003	oil
2.03	crystals m.p. 107-110
2.038	crystals m.p. 111-113
2.043	resin
2.044	crystals m.p. 105-106
2.045	amorphous

3.001	crystals m.p. 95-97
3.054	oil
3.055	crystals m.p. 108-110
3.056	resin, n_D 1.5509
4.009	crystals m.p. 107-109
4.01	oil
4.011	oil
4.014	crystals m.p. 148-149
4.021	crystals m.p. 44-45
4.033	crystals m.p. 46-48
4.124	crystals m.p. 46-48
4.328	oil
5.008	resin
5.081	resin
5.083	crystals m.p. 161-162
5.084	crystals m.p. 215-216
5.085	resin
6.006	crystals m.p. 176-177
6.041	crystals m.p. 186-187
6.076	crystals m.p. 195-196
6.111	crystals m.p. 163-164
7.009	ratio A: B = 2:1.H-NMR($CDCl_3$,ppm) SCH_3: A: 2.50; B: 2.66.
7.01	ratio A: B = 5:1. H-NMR($CDCl_3$,ppm) SCH_3: A: 2.50; B: 2.64.
7.011	ratio A: B = 9:1. H-NMR($CDCl_3$,ppm) SCH_3: A: 2.46; B: 2.59.
7.021	ratio A: B = 3:1. H-NMR($CDCl_3$,ppm) SCH_3: A: 2.50; B: 2.62.
7.18	ratio A: B = 2:. H-NMR($CDCl_3$,ppm) SO_2CH_3: A: 3.40; B: 3.58.
7.182	ratio A: B = 9:1. H-NMR($CDCl_3$,ppm) SO_2CH_3: A: 3.32; B: 3.50.
7.192	ratio A: B = 3:1. H-NMR($CDCl_3$,ppm) SO_2CH_3: A: 3.40; B: 3.58.
8.009	crystals m.p. 96-97
8.01	amorphous
8.011	oil
8.021	oil
9.009	crystals m.p. 112-113

9.01	amorphous
9.011	amorphous
9.021	oil

Biological Examples

Example B1: Herbical action before emergence of the plants (pre-emergence action)
Monocotyledonous and dicotyledonous test plants are sown in standard soil in plastic pots. Immediately after sowing, the test substances are sprayed on (500 l of water/ha) as an aqueous suspension (prepared from a 25% wettable powder (Example F3, b) according to WO 97/34485) or emulsion (prepared from a 25% emulsion concentrate (Example F1, c)), corresponding to a dosage of 2 kg of AS/ha. The test plants are then grown under optimum conditions in a greenhouse. After a test period of 3 weeks, the test is evaluated with a nine-level scale of ratings (1 = complete damage, 9 = no effect). Ratings of 1 to 4 (in particular 1 to 3) mean good to very good herbicidal action.

Table B1: pre-emergence action:

Test plant Active compound No.	Avena	Cyperus	Setaria	Sinapis	Solanum	Stellaria
1.009	2	1	1	2	1	2
1.376	2	1	1	2	1	2
4.009	1	2	1	2	1	3
7.009	4	2	1	3	1	2
1.381	4	1	2	2	1	1
1.011	2	1	1	1	1	1
5.008	2	1	1	2	1	2
4.021	2	1	2	2	1	2
1.010	2	1	1	1	1	2
1.021	4	2	1	1	1	3
1.398	2	1	1	1	1	1
1.195	2	1	1	1	1	2

4.124	2	1	2	2	1	2
1.411	3	2	1	2	1	2
1.042	4	2	2	1	1	4
1.023	2	2	2	1	1	2
1.109	2	2	2	2	1	3
1.313	3	1	2	1	1	2
1.401	2	1	1	2	1	2
1.404	2	1	1	2	1	2
1.400	2	1	1	2	1	2
1.403	2	1	1	1	1	2
1.405	2	1	1	1	1	2
1.406	2	1	1	1	1	2
1.402	2	1	1	2	1	2
1.005	4	1	1	1	1	1
1.043	4	2	1	2	1	2
1.409	1	1	1	1	1	1
1.41	2	1	1	1	1	1
1.06	2	1	1	2	1	1
7.192	4	2	2	3	2	2
7.021	1	1	1	1	1	1

The same results are obtained when the compounds of the formula I are formulated according to Examples F2 and F4 to F8 according to WO 97/34485.

Example B2: Post-emergence herbicidal action

Monocotyledonous and dicotyledonous test plants are grown in plastic pots with standard soil in a greenhouse and, in the 4- to 6-leaf stage, are sprayed with an aqueous suspension of the test substances of the formula I, prepared from a 25% wettable powder (Example F3, b) according to WO 97/34485) or with an emulsion of the test substances of the formula I, prepared from a 25% emulsion concentrate (Example F1, c) according to WO 97/34485), corresponding to a dosage of 2 kg of AS/ha (500 l of water/ha). The test plants are then grown further under optimum conditions in a greenhouse. After a test period of about 18 days, the test is evaluated with a nine-level scale of rating (1 = complete damage, 9 = no

effect). Ratings of 1 to 4 (in particular 1 to 3) mean good to very good herbicidal action. In this test, the compounds of the formula I show strong herbicidal action.

Table B2: post-emergence action:

Test plant	Avena	Setaria	Solanum	Sinapis	Stellaria
Active compound No.					
1.009	1	1	1	1	2
1.376	1	2	2	1	2
4.009	1	1	1	1	1
1.026	3	1	1	1	2
7.009	3	2	1	1	1
1.381	2	2	2	2	2
1.011	2	2	2	2	2
5.008	2	3	1	1	2
5.085	3	2	2	1	2
4.021	2	2	1	1	2
1.012	3	2	2	1	2
1.010	2	2	2	1	4
4.010	3	3	2	2	2
1.021	2	4	2	1	2
1.398	2	2	2	1	2
1.195	2	2	2	1	2
4.124	2	2	1	1	2
1.411	2	2	2	1	2
1.008	2	2	2	1	2
6.006	2	5	2	2	2
5.081	3	2	1	1	2
1.042	2	2	2	1	2
1.023	2	2	2	1	2
1.109	2	2	2	1	2
1.313	2	2	2	1	2

1.401	2	2	2	2	2
1.404	2	2	1	1	2
1.400	2	2	2	1	2
1.403	2	2	2	1	2
1.403	2	2	2	1	2
1.405	2	2	2	1	2
1.406	2	2	1	1	2
1.402	2	2	2	1	2
1.001	3	2	2	1	2
1.005	2	2	2	1	2
1.362	3	2	2	1	2
1.043	2	2	2	1	2
1.409	2	1	1	1	2
1.410	1	1	1	1	1
1.060	2	1	1	1	2
7.192	2	3	3	2	2
7.021	1	2	1	1	2
1.048	2	1	1	1	2

The same results are obtained when the compounds of the formula I are formulated according to Examples F2 and F4 to F8 according to WO 97/34485.

Example B3: Herbicidal action before emergence of the plants (pre-emergence action)

Monocotyledonous and dicotyledonous test plants are sown in pots in standard soil. Immediately after sowing, the test substances are sprayed on (500 l of spray liquor/ha) as an aqueous suspension, prepared from a wettable powder WP10 corresponding to the desired dosage (250 g of a.i./ha).

The test plants are then grown under optimum conditions in a greenhouse.

After a test period of 3 weeks, the test is evaluated with a nine-level scale of ratings (1 = complete damage, 9 = no effect). Ratings of 1 to 4 (in particular 1 to 3) mean good to very good herbicidal action, 7-9 mean good tolerance.

Table B3: Pre-emergence action:

Test plant	Abutilon	Amar-anthus	Cheno-podium	Kochia	Sida	Stellaria	Dose [g of AS/ha]
Active compound No.							
1.355	1	1	1	1	2	2	250
1.347	2	2	1	1	4	1	250
1.335	1	2	1	5	2	7	250
1.349	1	3	1	4	2	5	250
1.339	2	1	1	7	2	1	250
1.341	3	9	1	9	4	1	250
1.343	1	4	1	9	3	5	250

The same results are obtained when the compounds of the formula I are formulated according to Examples F2 and F4 to F8 according to WO 97/34485.

Example B4: Herbicidal action after the emergence of the plants (post-emergence action)

Monocotyledonous and dicotyledonous test plants are sown in pots in standard soil. In the 2-3-leaf stage of the test plants, the test substances are sprayed on (500 l of spray liquor/ha) as an aqueous suspension, prepared from a wettable powder WP10 according to the desired dosage (250 g of a.i./ha). 0.2% of X77 is added as wetting agent to the spray liquor. The test plants are then grown under optimum conditions in a greenhouse.

After a test period of 3 weeks, the test is evaluated with a nine-level scale of ratings (1 = complete damage, 9 = no effect). Ratings of 1 to 4 (in particular 1 to 3) mean good to very good herbicidal action, 7-9 mean good tolerance.

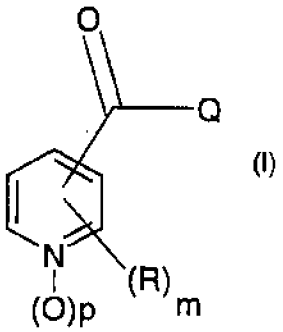
Table B4: Post-emergence action:

Test plant	Abutilon	Amar-anthus	Cheno-podium	Kochia	Setaria	Stellaria	Dose [g of AS/ha]
Active compound No.							
1.355	2	2	2	3	2	3	250
1.347	3	2	2	2	3	3	250
1.335	3	2	2	2	2	3	250
1.349	2	2	2	2	2	3	250
1.339	2	2	3	1	4	3	250
1.351	5	2	3	3	3	3	250
1.341	5	2	3	4	5	4	250
1.343	3	2	2	3	9	3	250
1.361	2	2	2	2	2	3	250

The same results are obtained when the compounds of the formula I are formulated according to Examples F2 and F4 to F8 according to WO 97/34485.

WHAT IS CLAIMED IS:

1. A compound of the formula I



(I)

in which

each R independently is C_1-C_6alkyl, C_2-C_6alkenyl, C_2-C_6haloalkenyl, C_2-C_6alkynyl, C_2-C_6 haloalkynyl, C_3-C_6cycloalkyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkyl, C_1-C_6haloalkylthio, C_1-C_6haloalkylsulfinyl, C_1-C_6 haloalkylsulfonyl, C_1-C_6alkoxycarbonyl, C_1-C_6alkylcarbonyl, C_1-C_6alkylamino, di-C_1-C_6 alkylamino, C_1-C_6alkylaminosulfonyl, di-C_1-C_6alkylaminosulfonyl, -N(R_1)-S-R_2, -N(R_3)-SO-R_4, -N(R_5)-SO_2-R_6, nitro, cyano, halogen, hydroxyl, amino, formyl, hydroxy-C_1-C_6alkyl, C_1-C_6 alkoxy-C_1-C_6alkyl, C_1-C_6alkoxycarbonyloxy-C_1-C_6alkyl, C_1-C_6alkylthio-C_1-C_6alkyl, C_1-C_6 alkylsulfinyl-C_1-C_6alkyl, C_1-C_6alkylsulfonyl-C_1-C_6alkyl, thiocyanato-C_1-C_6alkyl, cyano-C_1-C_6 alkyl, oxiranyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, C_1-C_6alkoxy-C_1-C_6alkoxy, cyano-C_1-C_6 alkenyloxy, C_1-C_6alkoxycarbonyloxy-C_1-C_6alkoxy, C_3-C_6alkynyloxy, cyano-C_1-C_6alkoxy, C_1-C_6 alkoxycarbonyl-C_1-C_6alkoxy, C_1-C_6alkylthio-C_1-C_6alkoxy, alkoxycarbonyl-C_1-C_6alkylthio, alkoxycarbonyl-C_1-C_6alkylsulfinyl, alkoxycarbonyl-C_1-C_6alkylsulfonyl, C_1-C_6alkylsulfonyloxy, C_1-C_6haloalkylsulfonyloxy, phenyl, benzyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzylthio, benzylsulfinyl or benzylsulfonyl, where the phenyl groups may be mono- or polysubstituted by halogen, methyl, ethyl, trifluoromethyl, methoxy or nitro, or R is a five- to ten-membered monocyclic or fused bicyclic ring system, which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, where the ring system is either attached directly to the pyridine ring or attached to the pyridine ring via a C_1-C_4alkylene group, and where each ring system may not contain more than 2 oxygen atoms and not more than two sulfur

atoms, and where the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6 haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5alkoxyalkylthio, C_3-C_5 acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6 haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylsulfonyl, aminosulfonyl, C_1-C_2 alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3alkylene-R_7, NR_8R_9, halogen, cyano, nitro, phenyl and benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, and where substituents on the nitrogen in the heterocyclic ring are different from halogen;

m is 1, 2, 3 or 4;

p is 0 or 1;

R_1, R_3 and R_5 independently of one another are hydrogen or C_1-C_6alkyl;

R_2 is $NR_{10}R_{11}$, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6 haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_3-C_6cycloalkyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

R_4 is $NR_{12}R_{13}$, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6 haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_3-C_6cycloalkyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

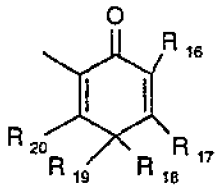
R_6 is $NR_{14}R_{15}$, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6 haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_3-C_6cycloalkyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

R_7 is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3 alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

R_8, R_{10}, R_{12} and R_{14} independently of one another are hydrogen or C_1-C_6alkyl;

R_9, R_{11}, R_{13} and R_{15} independently of one another are C_1-C_6alkyl or C_1-C_6alkoxy;

Q is the group Q_1



(Q_1),

in which

R_{16}, R_{17}, R_{18} and R_{19} independently of one another are hydrogen, hydroxyl, C_1-C_4alkyl, C_2-C_6alkenyl, C_2-C_6alkynyl, C_1-C_4alkoxycarbonyl, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_4alkyl-NHS(O)$_2$, C_1-C_4haloalkyl, -NH-C_1-C_4alkyl, -N(C_1-C_4alkyl)$_2$, C_1-C_6alkoxy, cyano, nitro, halogen or phenyl, which for its part may be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, amino, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_4alkyl-S(O)$_2$O, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4haloalkyl-S(O)$_2$O, C_1-C_4alkyl-S(O)$_2$NH, C_1-C_4alkyl-S(O)$_2$N(C_1-C_4alkyl), halogen, nitro, COOH or cyano; or two adjacent substituents from the group consisting of R_{16}, R_{17}, R_{18} and R_{19} form a C_2-C_6alkylene bridge;

R_{20} is hydroxyl, O^-M^+, halogen, cyano, SCN, OCN, C_1-C_{12}alkoxy, C_1-C_4alkoxycarbonyl-C_1-C_4alkoxy, C_1-C_{12}alkylthio, C_1-C_{12}alkylsulfinyl, C_1-C_{12}alkylsulfonyl, C_1-C_{12}haloalkylthio, C_1-C_{12}haloalkylsulfinyl, C_1-C_{12}haloalkylsulfonyl, C_1-C_6alkoxy-C_1-C_6alkylthio, C_1-C_6alkoxy-C_1-C_6alkylsulfinyl, C_1-C_6alkoxy-C_1-C_6alkylsulfonyl, C_2-C_{12}alkenylthio, C_2-C_{12}alkenylsulfinyl, C_2-C_{12}alkenylsulfonyl, C_2-C_{12}alkynylthio, C_2-C_{12}alkynylsulfinyl, C_2-C_{12}alkynylsulfonyl, C_2-C_{12}haloalkenylthio, C_2-C_{12}haloalkenylsulfinyl, C_2-C_{12}haloalkenylsulfonyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylthio, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfinyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfonyl, (C_1-C_4alkoxy)$_2$P(O)O, C_1-C_4alkyl-(C_1-C_4alkoxy)P(O)O, H(C_1-C_4alkoxy)P(O)O,

$R_{37}R_{38}N$, $R_{71}R_{72}NNH$-, $R_{21}R_{22}NC(O)O$-, $R_{73}R_{74}NC(O)NH$-, C_1-C_4alkyl-S(O)$_2$NR_{39}, C_1-C_4haloalkyl-S(O)$_2$NR_{40}, C_1-C_4alkyl-S(O)$_2$O, C_1-C_4haloalkyl-S(O)$_2$O, C_1-C_{18}alkylcarbonyloxy, where the alkyl group may be substituted by halogen, C_1-C_6alkoxy, C_1-C_6alkylthio or cyano, C_2-C_{18}alkenylcarbonyloxy, C_2-C_{18}alkynylcarbonyloxy, C_3-C_6cycloalkylcarbonyloxy, C_1-C_{12}alkoxycarbonyloxy, C_1-C_{12}alkylthiocarbonyloxy, C_1-C_{12}alkylthiocarbamoyl, C_1-C_6alkyl-NH(CS)N(C_1-C_6alkyl)-NH-, di-C_1-C_6alkyl-N(CS)N(C_1-C_6alkyl)-NH-, benzyloxy, benzylthio, benzylsulfinyl, benzylsulfonyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, phenylsulfonyloxy or benzoyloxy, where the phenyl groups for their part may each be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl,

C_1-C_4alkoxycarbonyl, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4 haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4alkyl-$S(O)_2N(C_1$-C_4 alkyl), halogen, nitro or cyano,

or a group Ar_1-thio, Ar_2-sulfinyl, Ar_3-sulfonyl, -OCO-Ar_4 or NH-Ar_5 in which Ar_1, Ar_2, Ar_3, Ar_4 and Ar_5 independently of one another are a five- to ten-membered monocyclic or fused bicyclic ring system which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, and in which each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms, and in which the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5 alkoxyalkylthio, C_3-C_5acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylsulfonyl, aminosulfonyl, C_1-C_2alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3alkylene-R_{41}, $NR_{42}R_{43}$, halogen, cyano, nitro, phenyl and benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, and where substituents on the nitrogen in the heterocyclic ring are different from halogen;

R_{41} is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3 alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3 haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

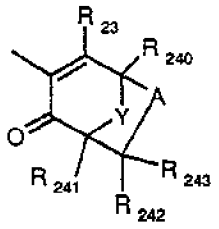
R_{42} is hydrogen or C_1-C_6alkyl;

R_{43} is C_1-C_6alkyl or C_1-C_6alkoxy;

R_{21}, R_{37}, R_{39}, R_{40}, R_{71} and R_{73} independently of one another are hydrogen or C_1-C_4alkyl;

R_{22}, R_{38}, R_{72} and R_{74} independently of one another are hydrogen, C_1-C_{12}alkyl, hydroxyl, C_1-C_{12}alkoxy, C_3-C_6alkenyloxy or C_3-C_6alkynyloxy; or R_{21} and R_{22} together or R_{37} and R_{38} together or R_{71} and R_{72} together or R_{73} and R_{74} together are pyrrolidino, piperidino, morpholino, thiomorpholino, which may be mono- or polysubstituted by methyl groups;

or are the group Q_2



(Q_2),

in which

Y is a chemical bond, an alkylene group A_1, carbonyl, oxygen, sulfur, sulfinyl, sulfonyl, $-NHR_{248}$ or $NH(CO)R_{249}$;

A_1 is $C(R_{246}R_{247})m_{01}$;

A is $C(R_{244}R_{245})r$;

r and m_{01} independently of one another are 0, 1 or 2;

R_{240} is hydrogen, methyl or C_1-C_3alkoxycarbonyl;

R_{241}, R_{242}, R_{243}, R_{244}, R_{245}, R_{246} and R_{247} independently of one another are hydrogen, halogen or methyl, or R_{243} together with an adjacent group R_{245} or R_{247} is a chemical bond;

R_{248} and R_{249} independently of one another are hydrogen or C_1-C_4alkyl;

R_{23} is hydroxyl, O^-M^+, halogen, cyano, SCN, OCN, C_1-C_{12}alkoxy, C_1-C_4alkoxycarbonyl-C_1-C_4alkoxy, C_1-C_{12}alkylthio, C_1-C_{12}alkylsulfinyl, C_1-C_{12}alkylsulfonyl, C_1-C_{12}haloalkylthio, C_1-C_{12}haloalkylsulfinyl, C_1-C_{12}haloalkylsulfonyl, C_1-C_6alkoxy-C_1-C_6alkylthio, C_1-C_6alkoxy-C_1-C_6alkylsulfinyl, C_1-C_6alkoxy-C_1-C_6alkylsulfonyl, C_2-C_{12}alkenylthio, C_2-C_{12}alkenylsulfinyl, C_2-C_{12}alkenylsulfonyl, C_2-C_{12}alkynylthio, C_2-C_{12}alkynylsulfinyl, C_2-C_{12}alkynylsulfonyl, C_2-C_{12}haloalkenylthio, C_2-C_{12}haloalkenylsulfinyl, C_2-C_{12}haloalkenylsulfonyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylthio, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfinyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfonyl, $(C_1$-C_4alkoxy$)_2P(O)O$, C_1-C_4alkyl-(C_1-C_4alkoxy)$P(O)O$, $H(C_1$-C_4alkoxy$)P(O)O$,

$R_{44}R_{45}N$, $R_{75}R_{76}NNH$-, $R_{46}R_{47}NC(O)O$-, $R_{77}R_{78}NC(O)NH$-, C_1-C_4alkyl-$S(O)_2NR_{48}$, C_1-C_4haloalkyl-$S(O)_2NR_{49}$, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_{18}alkylcarbonyloxy, where the alkyl group may be substituted by halogen, C_1-C_6alkoxy, C_1-C_6alkylthio or cyano, C_2-C_{18}alkenylcarbonyloxy, C_2-C_{18}alkynylcarbonyloxy, C_3-C_6cycloalkylcarbonyloxy, C_1-C_{12}alkoxycarbonyloxy, C_1-C_{12}alkylthiocarbonyloxy, C_1-C_{12}alkylthiocarbamoyl, C_1-C_6alkyl-NH(CS)N(C_1-C_6alkyl)-NH-, di-C_1-C_6alkyl-N(CS)N(C_1-C_6alkyl)-NH-, benzyloxy, benzylthio, benzylsulfinyl, benzylsulfonyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, phenylsulfonyloxy or benzoyloxy, where the phenyl groups for their part may each be

substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4 haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4alkyl-$S(O)_2N(C_1$-C_4 alkyl), halogen, nitro or cyano,

or a group Ar_6-thio, Ar_7-sulfinyl, Ar_8-sulfonyl, -OCO-Ar_9 or NH-Ar_{10} in which Ar_6, Ar_7, Ar_8, Ar_9 and Ar_{10} independently of one another are a five- to ten-membered monocyclic or fused bicyclic ring system which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, and in which each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms, and in which the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5 alkoxyalkylthio, C_3-C_5acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylsulfonyl, aminosulfonyl, C_1-C_2alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3alkylene-R_{50}, $NR_{51}R_{52}$, halogen, cyano, nitro, phenyl and benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, and where substituents on the nitrogen in the heterocyclic ring are different from halogen;

R_{50} is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3 alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

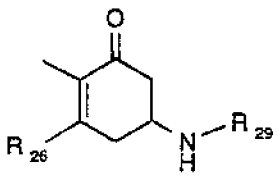
R_{51} is hydrogen or C_1-C_6alkyl;

R_{52} is C_1-C_6alkyl or C_1-C_6alkoxy;

R_{46}, R_{44}, R_{48}, R_{49}, R_{75} and R_{77} independentiy of one another are hydrogen or C_1-C_4alkyl;

R_{47}, R_{45}, R_{76} and R_{78} independently of one another are hydrogen, C_1-C_{12}alkyl, hydroxyl, C_1-C_{12}alkoxy, C_3-C_6alkenyloxy or C_3-C_6alkynyloxy; or R_{44} and R_{45} together or R_{46} and R_{47} together or R_{75} and R_{76} together or R_{77} and R_{78} together are pyrrolidino, piperidino, morpholino, thiomorpholino, which may be mono- or polysubstituted by methyl groups;

or are the group Q_3



(Q_3),

in which

R_{26} is hydroxyl, O^-M^+, halogen, cyano, SCN, OCN, C_1-C_{12}alkoxy, C_1-C_4alkoxycarbonyl-C_1-C_4alkoxy, C_1-C_{12}alkylthio, C_1-C_{12}alkylsulfinyl, C_1-C_{12}alkylsulfonyl, C_1-C_{12}haloalkylthio, C_1-C_{12}haloalkylsulfinyl, C_1-C_{12}haloalkylsulfonyl, C_1-C_6alkoxy-C_1-C_6alkylthio, C_1-C_6alkoxy-C_1-C_6alkylsulfinyl, C_1-C_6alkoxy-C_1-C_6alkylsulfonyl, C_2-C_{12}alkenylthio, C_2-C_{12}alkenylsulfinyl, C_2-C_{12}alkenylsulfonyl, C_2-C_{12}alkynylthio, C_2-C_{12}alkynylsulfinyl, C_2-C_{12}alkynylsulfonyl, C_2-C_{12}haloalkenylthio, C_2-C_{12}haloalkenylsulfinyl, C_2-C_{12}haloalkenylsulfonyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylthio, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfinyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfonyl, $(C_1$-C_4alkoxy$)_2P(O)O$, C_1-C_4alkyl-(C_1-C_4alkoxy)$P(O)O$, $H(C_1$-C_4alkoxy$)P(O)O$,

$R_{53}R_{54}N$, $R_{79}R_{80}NNH$-, $R_{55}R_{56}NC(O)O$-, $R_{81}R_{82}NC(O)NH$-, C_1-C_4alkyl-$S(O)_2NR_{57}$, C_1-C_4haloalkyl-$S(O)_2NR_{58}$, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_{18}alkylcarbonyloxy, where the alkyl group may be substituted by halogen, C_1-C_6alkoxy, C_1-C_6alkylthio or cyano, C_2-C_{18}alkenylcarbonyloxy, C_2-C_{18}alkynylcarbonyloxy, C_3-C_6cycloalkylcarbonyloxy, C_1-C_{12}alkoxycarbonyloxy, C_1-C_{12}alkylthiocarbonyloxy, C_1-C_{12}alkylthiocarbamoyl, C_1-C_6alkyl-NH(CS)N(C_1-C_6alkyl)-NH-, di-C_1-C_6alkyl-N(CS)N(C_1-C_6alkyl)-NH-, benzyloxy, benzylthio, benzylsulfinyl, benzylsulfonyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, phenylsulfonyloxy or benzoyloxy, where the phenyl groups for their part may each be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4alkyl-$S(O)_2N(C_1$-C_4alkyl), halogen, nitro or cyano,

or a group Ar_{11}-thio, Ar_{12}-sulfinyl, Ar_{13}-sulfonyl, -OCO-Ar_{14} or NH-Ar_{15} in which Ar_{11}, Ar_{12}, Ar_{13}, Ar_{14} and Ar_{15} independently of one another are a five- to ten-membered monocyclic or fused bicyclic ring system which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, and in

which each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms, and in which the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5 alkoxyalkylthio, C_3-C_5acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylsulfonyl, aminosulfonyl, C_1-C_2alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3alkylene-R_{59}, $NR_{60}R_{61}$, halogen, cyano, nitro, phenyl and benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, and where substituents on the nitrogen in the heterocyclic ring are different from halogen;

R_{59} is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3 alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

R_{60} is hydrogen or C_1-C_6alkyl;

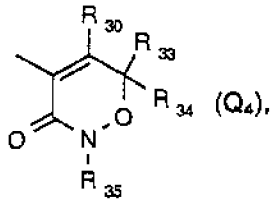
R_{61} is C_1-C_6alkyl or C_1-C_6alkoxy;

R_{55}, R_{53}, R_{57}, R_{58}, R_{79} and R_{81} independently of one another are hydrogen or C_1-C_4alkyl;

R_{56}, R_{54}, R_{80} and R_{82} independently of one another are hydrogen, C_1-C_{12}alkyl, hydroxyl, C_1-C_{12}alkoxy, C_3-C_6alkenyloxy or C_3-C_6alkynyloxy; or R_{53} and R_{54} together or R_{55} and R_{56} together or R_{79} and R_{80} together or R_{81} and R_{82} together are pyrrolidino, piperidino, morpholino, thiomorpholino, which may be mono- or polysubstituted by methyl groups;

R_{29} is hydrogen, C_1-C_6alkyl, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, (C_1-C_4alkyl)NHCO, phenylaminocarbonyl, benzylaminocarbonyl or (C_1-C_4alkyl)$_2$NCO, where the phenyl and benzyl groups for their part may each be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4 alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, C_1-C_4alkylamino, di-C_1-C_4 alkylamino, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4alkyl-S(O)$_2$O, C_1-C_4 haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4haloalkyl-S(O)$_2$O, C_1-C_4 alkyl-S(O)$_2$NH, C_1-C_4alkyl-S(O)$_2$N(C_1-C_4alkyl), halogen, nitro or cyano;

or is the group Q_4



(Q4),

in which

R_{30} is hydroxyl, O^-M^+, halogen, cyano, SCN, OCN, C_1-C_{12}alkoxy, C_1-C_4alkoxycarbonyl-C_1-C_4 alkoxy, C_1-C_{12}alkylthio, C_1-C_{12}alkylsulfinyl, C_1-C_{12}alkylsulfonyl, C_1-C_{12}haloalkylthio, C_1-C_{12} haloalkylsulfinyl, C_1-C_{12}haloalkylsulfonyl, C_1-C_6alkoxy-C_1-C_6alkylthio, C_1-C_6alkoxy-C_1-C_6 alkylsulfinyl, C_1-C_6alkoxy-C_1-C_6alkylsulfonyl, C_2-C_{12}alkenylthio, C_2-C_{12}alkenylsulfinyl, C_2-C_{12} alkenylsulfonyl, C_2-C_{12}alkynylthio, C_2-C_{12}alkynylsulfinyl, C_2-C_{12}alkynylsulfonyl, C_2-C_{12} haloalkenylthio, C_2-C_{12}haloalkenylsulfinyl, C_2-C_{12}haloalkenylsulfonyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylthio, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfinyl, C_1-C_4alkoxycarbonyl-C_1-C_4alkylsulfonyl, $(C_1$-C_4alkoxy$)_2P(O)O$, C_1-C_4alkyl-(C_1-C_4alkoxy)P(O)O, H(C_1-C_4alkoxy)P(O)O,

$R_{62}R_{63}N$, $R_{83}R_{84}NNH$-, $R_{64}R_{65}NC(O)O$-, $R_{85}R_{86}NC(O)NH$-, C_1-C_4alkyl-$S(O)_2NR_{66}$, C_1-C_4 haloalkyl-$S(O)_2NR_{67}$, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_{18}alkylcarbonyloxy, where the alkyl group may be substituted by halogen, C_1-C_6alkoxy, C_1-C_6alkylthio or cyano, C_2-C_{18}alkenylcarbonyloxy, C_2-C_{18}alkynylcarbonyloxy, C_3-C_6cycloalkylcarbonyloxy, C_1-C_{12} alkoxycarbonyloxy, C_1-C_{12}alkylthiocarbonyloxy, C_1-C_{12}alkylthiocarbamoyl, C_1-C_6alkyl-NH(CS)N(C_1-C_6alkyl)-NH-, di-C_1-C_6alkyl-N(CS)N(C_1-C_6alkyl)-NH-, benzyloxy, benzylthio, benzylsulfinyl, benzylsulfonyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, phenylsulfonyloxy or benzoyloxy, where the phenyl groups for their part may each be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4 haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4alkyl-$S(O)_2N(C_1$-C_4 alkyl), halogen, nitro or cyano,

or a group Ar_{16}-thio, Ar_{17}-sulfinyl, Ar_{18}-sulfonyl, -OCO-Ar_{19} or NH-Ar_{20} in which Ar_{16}, Ar_{17}, Ar_{18}, Ar_{19} and Ar_{20} independently of one another are a five- to ten-membered monocyclic or fused bicyclic ring system which may be aromatic or partially saturated and may contain 1 to 4 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur, and in

which each ring system may not contain more than 2 oxygen atoms and not more than two sulfur atoms, and in which the ring system for its part may be mono-, di- or trisubstituted by C_1-C_6alkyl, C_1-C_6haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, mercapto, C_1-C_6alkylthio, C_1-C_6haloalkylthio, C_3-C_6alkenylthio, C_3-C_6haloalkenylthio, C_3-C_6alkynylthio, C_2-C_5 alkoxyalkylthio, C_3-C_5acetylalkylthio, C_3-C_6alkoxycarbonylalkylthio, C_2-C_4cyanoalkylthio, C_1-C_6alkylsulfinyl, C_1-C_6haloalkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylsulfonyl, aminosulfonyl, C_1-C_2alkylaminosulfonyl, C_2-C_4dialkylaminosulfonyl, C_1-C_3alkylene-R_{68}, $NR_{69}R_{70}$, halogen, cyano, nitro, phenyl and benzylthio, where phenyl and benzylthio for their part may be substituted on the phenyl ring by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro, and where substituents on the nitrogen in the heterocyclic ring are different from halogen;

R_{68} is C_1-C_3alkoxy, C_2-C_4alkoxycarbonyl, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or phenyl, where phenyl for its part may be substituted by C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3 alkoxy, C_1-C_3haloalkoxy, halogen, cyano or nitro;

R_{70} is hydrogen or C_1-C_6alkyl;

R_{61} is C_1-C_6alkyl or C_1-C_6alkoxy;

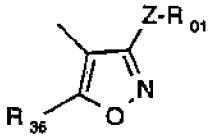
R_{64}, R_{62}, R_{66}, R_{67}, R_{83} and R_{85} independently of one another are hydrogen or C_1-C_4alkyl;

R_{65}, R_{63}, R_{84} and R_{86} independently of one another are hydrogen, C_1-C_{12}alkyl, hydroxyl, C_1-C_{12}alkoxy, C_3-C_6alkenyloxy or C_3-C_6alkynyloxy; or R_{62} and R_{63} together or R_{64} and R_{65} together or R_{83} and R_{84} together or R_{85} and R_{86} together are pyrrolidino, piperidino, morpholino, thiomorpholino, which may be mono- or polysubstituted by methyl groups;

R_{33} and R_{34} independently of one another are hydrogen, C_1-C_4alkyl, C_2-C_6alkenyl, C_2-C_6 alkynyl, C_1-C_4alkoxycarbonyl, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_4 alkyl-$NHS(O)_2$, C_1-C_4haloalkyl, -NH-C_1-C_4alkyl, -$N(C_1$-C_4alkyl$)_2$, C_1-C_6alkoxy or phenyl, which for its part may be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylcarbonyl, C_1-C_4alkoxycarbonyl, amino, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_6 alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4 haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4 alkyl-$S(O)_2N(C_1$-C_4alkyl), halogen, nitro, COOH or cyano; or R_{33} and R_{34} together form a C_2-C_6alkylene bridge; and

R_{35} is hydrogen, C_1-C_6alkyl, C_3-C_6alkenyl, C_3-C_6alkynyl or benzyl, which for its part may be substituted by halogen, methyl or methoxy, or is C_1-C_4alkoxycarbonyl or phenyl, which for its part may be substituted by C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4

alkylcarbonyl, C_1-C_4alkoxycarbonyl, amino, C_1-C_4alkylamino, di-C_1-C_4alkylamino, C_1-C_4 alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkylthio, C_1-C_4 haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4haloalkyl-$S(O)_2O$, C_1-C_4alkyl-$S(O)_2NH$, C_1-C_4 alkyl-$S(O)_2N(C_1$-C_4alkyl), halogen, nitro, COOH or cyano;
or is the group Q_5



(Q_5),

in which
Z is S, SO or SO_2;
R_{01} is hydrogen, C_1-C_8alkyl, C_1-C_8alkyl substituted by halogen, C_1-C_4alkoxy, C_1-C_4alkylthio, C_1-C_4alkylsulfonyl, C_1-C_4alkylsulfinyl, $-CO_2R_{02}$, $-COR_{03}$, $-COSR_{04}$, $-NR_{05}R_{06}$, $CONR_{036}R_{037}$ or phenyl, which for its part may be substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4 alkyl, (C_1-C_4alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4 alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, $N(C_1$-C_6alkyl)SO_2-C_1-C_4alkyl, $N(C_1$-C_6alkyl)SO_2-phenyl, $N(C_2$-C_6alkenyl)SO_2-C_1-C_4alkyl, $N(C_2$-C_6alkenyl)SO_2-phenyl, $N(C_3$-C_6alkynyl)SO_2-C_1-C_4alkyl, $N(C_3$-C_6alkynyl)SO_2-phenyl, $N(C_3$-C_7cycloalkyl)SO_2-C_1-C_4alkyl, $N(C_3$-C_7 cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{25}R_{26}$, OSO_2-C_1-C_4haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or $-NR_{015}CO_2R_{027}$;
or R_{01} is C_2-C_8alkenyl or C_2-C_8alkenyl substituted by halogen, C_1-C_4alkoxy, C_1-C_4alkylthio, C_1-C_4alkylsulfonyl, C_1-C_4alkylsulfinyl, $-CONR_{032}R_{033}$, cyano, nitro, -CHO, $-CO_2R_{038}$, $-COR_{039}$, -COS-C_1-C_4alkyl, $-NR_{034}R_{035}$ or phenyl which for its part may be substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, $N(C_1$-C_6alkyl)SO_2-C_1-C_4 alkyl, $N(C_1$-C_6alkyl)SO_2-phenyl, $N(C_2$-C_6alkenyl)SO_2-C_1-C_4alkyl, $N(C_2$-C_6alkenyl)SO_2-phenyl, $N(C_3$-C_6alkynyl)SO_2-C_1-C_4alkyl, $N(C_3$-C_6alkynyl)SO_2-phenyl, $N(C_3$-C_7cycloalkyl)SO_2-C_1-C_4 alkyl, $N(C_3$-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-

C_1-C_4alkyl, $CONR_{040}R_{041}$, OSO_2-C_1-C_4haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or $-NR_{043}CO_2R_{042}$;
or R_{01} is C_3-C_6alkynyl or C_3-C_6alkynyl substituted by halogen, C_1-C_4haloalkyl, cyano, $-CO_2R_{044}$ or phenyl, which for its part may be substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, N(C_1-C_6alkyl)SO_2-C_1-C_4alkyl, N(C_1-C_6alkyl)SO_2-phenyl, N(C_2-C_6alkenyl)SO_2-C_1-C_4alkyl, N(C_2-C_6alkenyl)SO_2-phenyl, N(C_3-C_6alkynyl)SO_2-C_1-C_4alkyl, N(C_3-C_6alkynyl)SO_2-phenyl, N(C_3-C_7cycloalkyl)SO_2-C_1-C_4alkyl, N(C_3-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{028}R_{029}$, OSO_2-C_1-C_4haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or $-NR_{031}CO_2R_{030}$;
or R_{01} is C_3-C_7cycloalkyl, C_3-C_7cycloalkyl substituted by C_1-C_4alkyl, C_1-C_4alkoxy, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl or phenyl, which for its part may be substituted by halogen, nitro, cyano, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkylthio, C_1-C_4haloalkylthio, C_1-C_4alkyl and C_1-C_4haloalkyl; or
R_{01} is C_1-C_4alkylene-C_3-C_7cycloalkyl, phenyl, or phenyl which is substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, N(C_1-C_6alkyl)SO_2-C_1-C_4alkyl, N(C_1-C_6alkyl)SO_2-phenyl, N(C_2-C_6alkenyl)SO_2-C_1-C_4alkyl, N(C_2-C_6alkenyl)SO_2-phenyl, N(C_3-C_6alkynyl)SO_2-C_1-C_4alkyl, N(C_3-C_6alkynyl)SO_2-phenyl, N(C_3-C_7cycloalkyl)SO_2-C_1-C_4alkyl, N(C_3-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{045}R_{046}$, OSO_2-C_1-C_4haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, or $-NR_{048}CO_2R_{047}$; or
R_{01} is C_1-C_4alkylene-phenyl, COR_{07} or 4-6-membered heterocyclyl;
R_{02}, R_{038}, R_{044} and R_{066} independently of one another are hydrogen, C_1-C_4alkyl, phenyl, or phenyl which is substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH,

$COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4 alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, N(C_1-C_6alkyl)SO_2-C_1-C_4alkyl, N(C_1-C_6alkyl)SO_2-phenyl, N(C_2-C_6 alkenyl)SO_2-C_1-C_4alkyl, N(C_2-C_6alkenyl)SO_2-phenyl, N(C_3-C_6alkynyl)SO_2-C_1-C_4alkyl, N(C_3-C_6 alkynyl)SO_2-phenyl, N(C_3-C_7cycloalkyl)SO_2-C_1-C_4alkyl, N(C_3-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{049}R_{050}$, OSO_2-C_1-C_4 haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or $-NR_{052}CO_2R_{053}$;

R_{03}, R_{039} and R_{067} independently of one another are C_1-C_4alkyl, phenyl or phenyl which is substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6alkenyl, C_3-C_6 alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, N(C_1-C_6alkyl)SO_2-C_1-C_4alkyl, N(C_1-C_6alkyl)SO_2-phenyl, N(C_2-C_6alkenyl)SO_2-C_1-C_4alkyl, N(C_2-C_6alkenyl)SO_2-phenyl, N(C_3-C_6alkynyl)SO_2-C_1-C_4alkyl, N(C_3-C_6alkynyl)SO_2-phenyl, N(C_3-C_7 cycloalkyl)SO_2-C_1-C_4alkyl, N(C_3-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{070}R_{054}$, OSO_2-C_1-C_4haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or $-NR_{056}CO_2R_{055}$;

R_{04} is C_1-C_4alkyl;

R_{05} is hydrogen, C_1-C_4alkyl, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_7cycloalkyl, phenyl or phenyl which is substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6 alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4 alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, N(C_1-C_6alkyl)SO_2-C_1-C_4alkyl, N(C_1-C_6alkyl)SO_2-phenyl, N(C_2-C_6 alkenyl)SO_2-C_1-C_4alkyl, N(C_2-C_6alkenyl)SO_2-phenyl, N(C_3-C_6alkynyl)SO_2H, N(C_3-C_6 alkynyl)SO_2-C_1-C_4alkyl, N(C_3-C_6alkynyl)SO_2-phenyl, N(C_3-C_7cycloalkyl)SO_2H, N(C_3-C_7 cycloalkyl)SO_2-C_1-C_4alkyl, N(C_3-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{057}R_{058}$, OSO_2-C_1-C_4haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl,

phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or -$NR_{060}CO_2R_{059}$;

R_{06} is hydrogen, C_1-C_4alkyl, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_7cycloalkyl, phenyl or phenyl which is substituted by C_1-C_4alkyl, C_1-C_6haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_6 alkenyl, C_3-C_6alkynyl, C_3-C_6alkenyloxy, C_3-C_6alkynyloxy, halogen, nitro, cyano, -COOH, $COOC_1$-C_4alkyl, COOphenyl, C_1-C_4alkoxy, phenoxy, (C_1-C_4alkoxy)-C_1-C_4alkyl, (C_1-C_4 alkylthio)-C_1-C_4alkyl, (C_1-C_4alkylsulfinyl)-C_1-C_4alkyl, (C_1-C_4alkylsulfonyl)-C_1-C_4alkyl, $NHSO_2$-C_1-C_4alkyl, $NHSO_2$-phenyl, N(C_1-C_6alkyl)SO_2-C_1-C_4alkyl, N(C_1-C_6alkyl)SO_2-phenyl, N(C_2-C_6 alkenyl)SO_2-C_1-C_4alkyl, N(C_2-C_6alkenyl)SO_2-phenyl, N(C_3-C_6alkynyl)SO_2-C_1-C_4alkyl, N(C_3-C_6 alkynyl)SO_2-phenyl, N(C_3-C_7cycloalkyl)SO_2-C_1-C_4alkyl, N(C_3-C_7cycloalkyl)SO_2-phenyl, N(phenyl)SO_2-C_1-C_4alkyl, N(phenyl)SO_2-phenyl, OSO_2-C_1-C_4alkyl, $CONR_{061}R_{062}$, OSO_2-C_1-C_4 haloalkyl, OSO_2-phenyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, phenylthio, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, phenylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, phenylsulfinyl, C_1-C_4alkylene-phenyl or -$NR_{064}CO_2R_{063}$;

R_{07} is phenyl, substituted phenyl, C_1-C_4alkyl, C_1-C_4alkoxy or -$NR_{08}R_{09}$;

R_{08} and R_{09} independently of one another are C_1-C_4alkyl, phenyl or phenyl which is substituted by halogen, nitro, cyano, C_1-C_4alkyl, C_1-C_4alkoxy, C_1-C_4thioalkyl, -CO_2R_{066}, -COR_{067}, C_1-C_4alkylsulfonyl, C_1-C_4alkylsulfinyl, C_1-C_4haloalkyl; or R_{08} and R_{09} together form a 5-6-membered ring which may be interrupted by oxygen, NR_{065} or S,

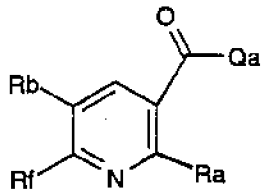
R_{015}, R_{031}, R_{043}, R_{048}, R_{052}, R_{056}, R_{060} and R_{064} independently of one another are hydrogen, C_1-C_4alkyl, C_2-C_6alkenyl, C_3-C_6alkynyl or C_3-C_7cycloalkyl;

R_{025}, R_{026}, R_{027}, R_{028}, R_{029}, R_{030}, R_{032}, R_{033}, R_{034}, R_{035}, R_{036}, R_{037}, R_{040}, R_{041}, R_{042}, R_{045}, R_{046}, R_{047}, R_{049}, R_{050}, R_{053}, R_{054}, R_{055}, R_{057}, R_{058}, R_{059}, R_{061}, R_{062}, R_{063}, R_{065} and R_{070} independently of one another are hydrogen, C_1-C_4alkyl, C_2-C_6alkenyl, C_3-C_6alkynyl, C_3-C_7cycloalkyl, phenyl, or phenyl which is substituted by halogen, nitro, cyano, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4 alkylthio, C_1-C_4haloalkylthio, C_1-C_4alkyl or C_1-C_4haloalkyl; and

R_{36} is C_1-C_4alkyl, C_1-C_4haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6 haloalkynyl, C_3-C_6cycloalkyl or C_3-C_6cycloalkyl which is substituted by halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_3-C_6alkenyl, C_3-C_6haloalkenyl, C_3-C_6alkynyl, C_3-C_6haloalkynyl, C_1-C_4 alkoxycarbonyl, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylthio, C_1-C_4haloalkylsulfinyl, C_1-C_4haloalkylsulfonyl, C_1-C_4alkylcarbonyl, di-C_1-C_4alkylamino, C_1-C_4 alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkyl-$S(O)_2O$, C_1-C_4haloalkyl-$S(O)_2O$ or phenyl which for its part may be substituted by halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_3-C_6alkenyl, C_3-C_6alkynyl,

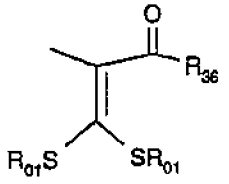
cyano, nitro or COOH; and agronomically acceptable salts M^+ and all stereoisomers and tautomers of the compounds of the formula I.

2. A compound of the formula IIa



(IIa)

in which Q_a is hydroxyl, halogen, cyano or a group $-CH_2(CO)R_{36}$ or



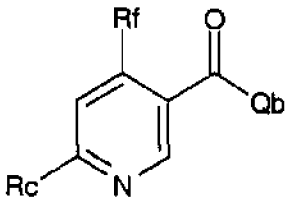
;

R_b is hydrogen, C_1-C_4alkyl or halogen;

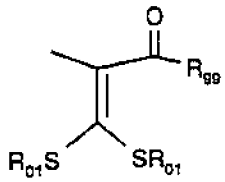
R_f is trifluoromethyl, difluorochloromethyl, pentafluoroethyl, heptafluoro-n-propyl or trichloromethyl;

R_a is C_1-C_3alkyl, C_1-C_3haloalkyl, C_3.C_4cycloalkyl, C_1-C_2alkoxy-C_1-C_4alkyl , C_1-C_2 alkythiomethyl, hydroxyl, halogen, cyano, C_1-C_3alkoxy, C_1-C_3haloalkoxy, allyloxy, propargyloxy, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl or C_1-C_3alkylsulfonyloxy, and R_{01} and R_{36} are defined as under group Q_5 of the formula I, except for the compounds 2,6-bis-trifluoromethylnicotinic acid, 2,6-bis-trifluoromethyl-5-methoxynicotinic acid and 2-hydroxy-6-trifluoromethylnicotinic acid.

3. A compound of the formula IIb



(IIb) ,

in which Q_b is hydroxyl, halogen, cyano, or a group $-CH_2(CO)R_{99}$ or 

;

R_{99} is C_1-C_4alkyl, C_1-C_4haloalkyl, C_3-C_4cycloalkyl or C_1-C_4alkoxy;
R_f is trifluoromethyl, difluorochloromethyl, pentafluoroethyl or heptafluoro-n-propyl; and
R_c is C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_2alkoxymethyl, C_1-C_2alkylthiomethyl, hydroxyl, halogen, cyano, C_1-C_3alkoxy, C_1-C_3haloalkoxy, allyloxy, propargyloxy, C_1-C_3alkylthio, C_1-C_3 alkylsulfinyl, C_1-C_3alkylsulfonyl or C_1-C_3alkylsulfonyloxy and R_{01} is as defined under formula I.

4. A herbicidal and plant-growth-inhibiting composition, which contains a herbicidally effective amount of a compound of the formula I on an inert carrier.

5. A method for controlling undesirable plant growth, wherein a herbicidally effective amount of an active compound of the formula I or a composition which contains this active compound is applied to the plants or their habitat.

6. A method for inhibiting plant growth, wherein a herbicidally effective amount of an active compound of the formula I or a composition which contains this active compound is applied to the plants or their habitat.

7. The use of a composition according to claim 4 for controlling undesirable plant growth.

INTERNATIONAL SEARCH REPORT

Intenational Application No
PCT/EP 99/06761

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C07D213/61 C07D213/50 C07D213/26 C07D213/89 C07D405/12
C07D401/12 C07D417/12 C07D401/04 C07D413/06 C07D413/14
C07D417/14 C07D413/04 A01N43/40

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C07D A01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 97 46530 A (DU PONT ;TSENG CHI PING (US); PATEL KANU MAGANBHAI (US); RORER MOR) 11 December 1997 (1997-12-11) cited in the application claims 1,16,17; examples	1,4-7
A	WO 97 34485 A (CIBA GEIGY AG ;RUEEGG WILLY (CH)) 25 September 1997 (1997-09-25) cited in the application examples	1,4-7
A	GB 2 305 174 A (ZENECA LTD) 2 April 1997 (1997-04-02) example 11	2
A	US 4 747 871 A (MONSANTO COMPANY) 31 May 1988 (1988-05-31) claim 1	2

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
9 December 1999	11/01/2000

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter ional Application No
PCT/EP 99/06761

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